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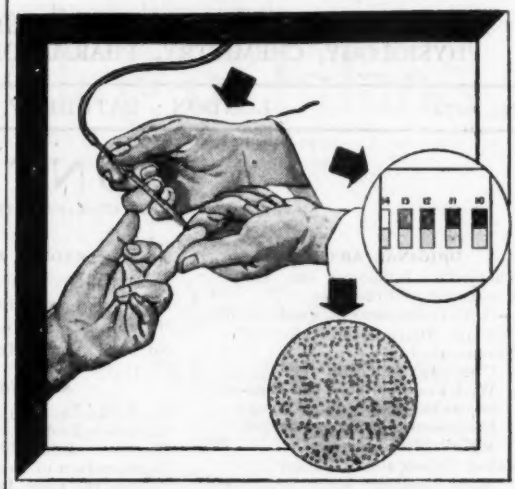

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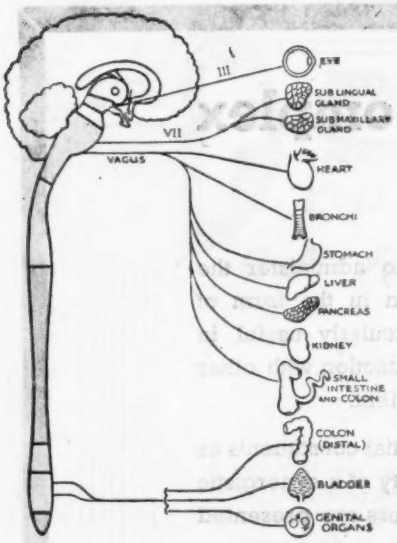

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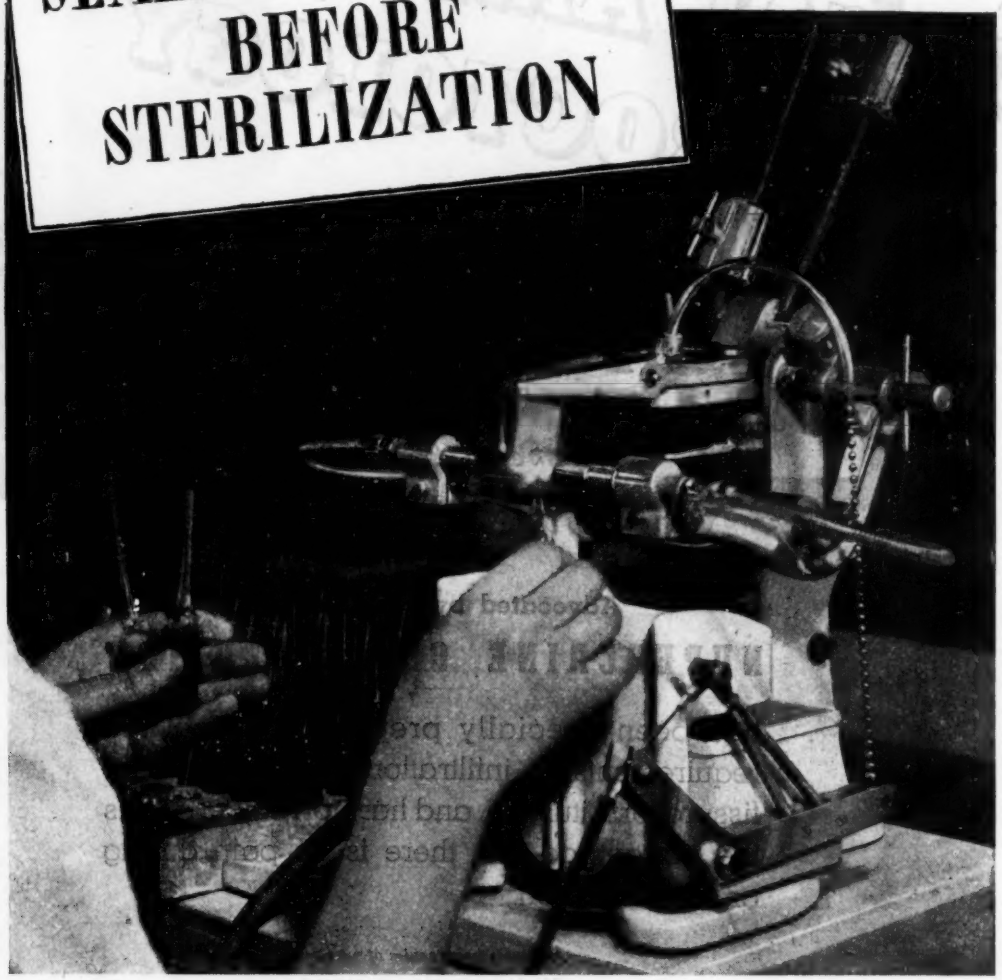

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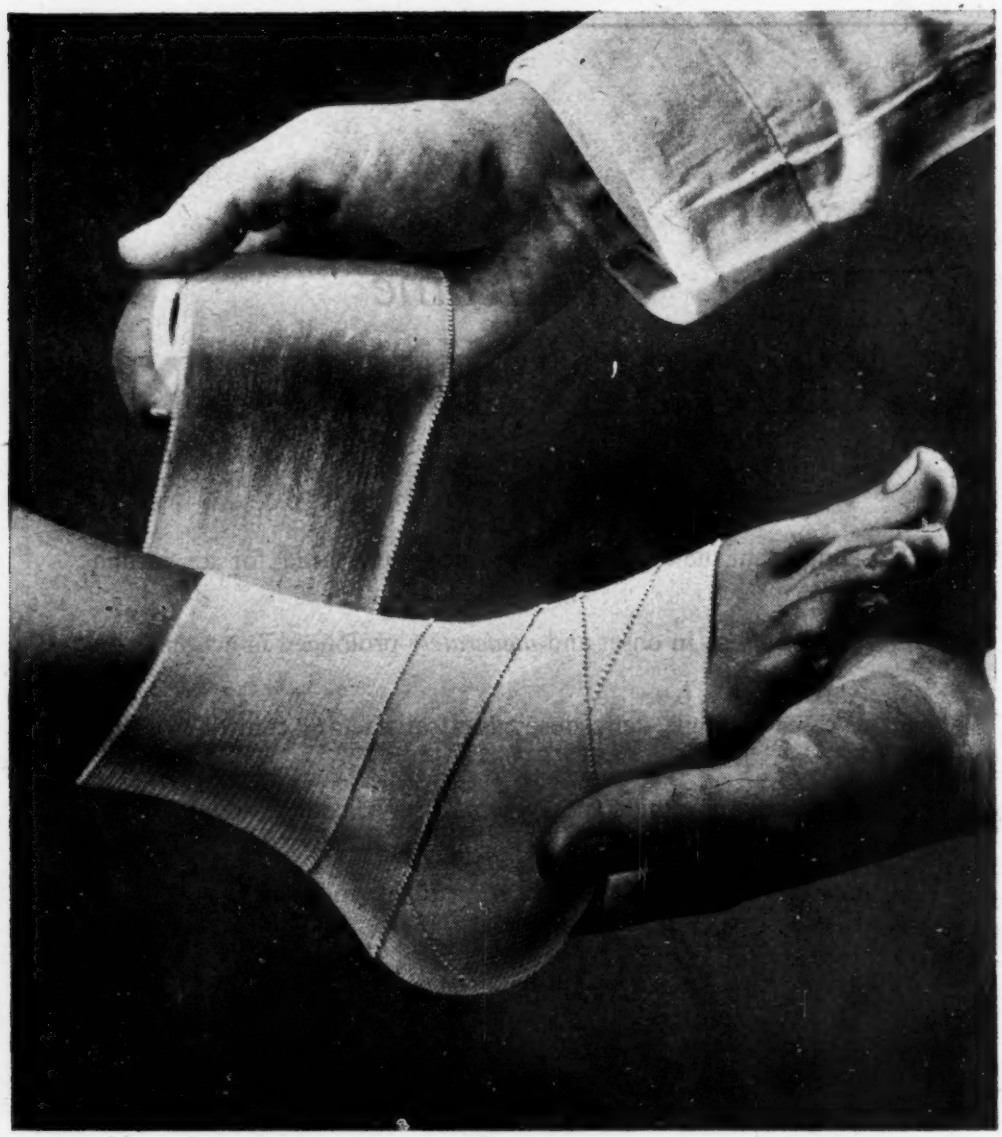

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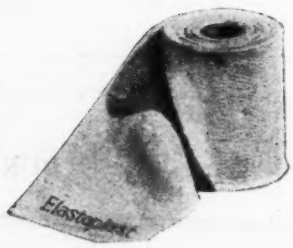

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ORTHOPÆDIC INFLUENCE ON THE TREATMENT OF FRACTURES

A CLINICAL STUDY *

G. R. GIRDLESTONE, BM OXFD, FRCS
CONSULTING ORTHOPÆDIC SURGEON, WINGFIELD-MORRIS HOSPITAL, AND RADCLIFFE INFIRMARY, OXFORD

ONCE in his two years' term of office you encourage your president to talk to you without restraint, hoping, of course, that he will choose some subject appropriate and timely. I want to talk to you about the treatment of fractures in this country, to tell you how I think we can help to raise the general standard, and then to follow some lines of thought on clinical problems in this field.

As I shall soon be finding fault and proposing remedies, you may well ask for evidence of my competence as a judge and a reformer. The best answer I can give is that close on 30 years ago I found a job after my own heart under great leaders and in good company. For shortly before the first great war I came in contact with Robert Jones and Agnes Hunt at Baschurch, and soon found myself heavily infected with orthopædics. My orthopædic education has fallen into three phases, those of the two wars and the time between.

In the first great war burrowing sepsis, shattered bones, and extensive loss of soft parts presented every kind of orthopædic problem.

In the twenty years between the wars I had ample opportunity of applying to fractures and to every sort of complication and failure the principles of orthopædic surgery which I was beginning to understand.

Then came the present war, in which one side of my work has given me a comprehensive view of the treatment of accidents in the hospitals of six counties. Only here and there have I found a hospital with a good accident service, although the case for such a service has been proved to the hilt. A great many doctors are doing excellent work for fractures with few facilities; but I have had a chance to appreciate how much unnecessary suffering, delay and loss of function results from the treatment of accidents by men who seem to have given little time and thought to the matter. This is both so distressing and so wasteful that for months I have been racking my brains for a remedy; and I have come to the conclusion that it lies in the clinical activities of the members of our association. I am therefore asking very seriously for your help.

Perhaps I can only enable you to realise the sort of thing that is happening by describing in some detail the maltreatment of one particular case.

A HOSPITAL WITHOUT AN ACCIDENT SERVICE

Not very long ago I visited a hospital because the staff had appealed to their Member of Parliament asking him to do what he could to stop the transfer of Service and other fractures from their hospital to the neighbouring orthopædic centre, since they felt perfectly competent to deal with fractures themselves. On my arrival I was introduced to the staff, and then taken to the theatre where a fracture table and two complex reduction mechanisms had been set up. We passed on to the wards. The climax of an unhappy round was reached when we came to the last case, a young soldier who lay moaning and was clearly in great pain. He had been admitted some six days before as a result of accidental bullet wounds which had broken the shaft of his left femur and his left internal malleolus. The history was that after he had been treated for shock his wounds had been excised, and packed, then three or four days later sutured, though his chart showed unabated fever. A long Liston splint was bandaged to his leg and thigh but in no way connected with the pelvis or trunk; indeed the whole upper part projected free in the bed far from the body: the limb below the fracture was twisted inwards and the thigh was lying in a varus curve at the site of the fracture, for the splint had no upper attachment and therefore no control over the fracture either in alignment or rotation: the bandages were soaked with pus and I was told that they were removed for daily dressing of the wound. The man's sufferings were great, needless and futile. It was a situation exciting both pity and anger. Yet at the end of the round the members of the staff seemed unaware of having passed through any unusual experience.

I learned that accidents reaching the hospital were received in turn day by day by the seven members of the surgical staff. The victim of an accident took his luck, good, bad or indifferent. This miserable visit was rounded off by the information that no single member of the staff had been to see fractures well treated at the orthopædic centre 20 miles or so away. I had seen a modern well-equipped hospital of 100 beds or more, staffed by a group of doctors who seemed completely blind to the dire results of their ignorance of fractures, and so complacent that none of them had motored a few miles to see first-class work. Appalling as this example was, it is by no means unique. I know other reputable hospitals in which the same fundamental faults exist. And what is true of the few big fractures is true also of the many little ones, which often require just as much skill and care.

The apathy of many doctors toward fractures has its origin far away and long ago, for, as Hey Groves used often to tell us, from his long experience as an examiner, the teaching of fractures has been badly neglected. Taught little, and by inexperienced residents, if taught at all, many of these young graduates went straight into "private" practice, or to a house-appointment in a non-teaching hospital to work in wards quite secluded from an uninvited consultant. Their treatment now is based on what they picked up in their training 10, 20 or 30 years ago; they are not careless or unfeeling, but just oblivious of a blind spot, and so much in a rut that they do not take the trouble to go and see what a modern accident service is like.

THE DISORDER IS PATENT—WHAT IS THE REMEDY?

Some of us may be inclined to answer this question by saying that accident services are already being developed in many parts of the country, and that the postwar reorganisation of medicine will put these things right. This is all to the good, and students will have the opportunity of seeing experts at work, and of taking part in their activities. For geographical reasons however it is likely to be impracticable to bring all fractures directly under the care of specialists; and, if so, it will be necessary to make some provision in the smaller hospitals. This will cover the treatment of the easier fractures and the primary care of the more difficult. But any organisation will fail if it lacks a due regard for human factors: and two conditions seem essential (1) that the most suitable men available are chosen for the primary care of fractures and fully informed in methods of safety, and (2) that the transfer of the difficult fractures brings them into thoroughly expert hands. The former condition will be well and quickly realised if the doctors in each district grasp the idea, and carry out the selection, picking one or two men from among themselves with good hands and an interest in the power and movement of the body. These men or their colleagues must possess a sound and scientific understanding of shock and resuscitation.

I think that every doctor in the kingdom whose private or hospital work includes the treatment of fractures should know how to splint a fracture effectively and comfortably with a view to easy transport, and in doing so regard three freedoms:—

(1) Freedom from pain.
(2) Freedom from pins (whenever possible).
(3) Freedom of the circulation in the injured part.

Free circulation is, of course, a vital necessity in every case; but the warning signs of Volkmann's ischæmia must be specially recognised, and treated in the light of their implications. Such are the conditions which make for the safety of the part and facilitate the transport of the patient. They can generally be satisfied by simple and straightforward means; a sling or split plaster for the upper limb, for the lower a Thomas splint (skin traction, lamp-wicks and all in the old-fashioned manner) or a split plaster. The understanding of the application of a few simple methods can be acquired by everyone prepared to give up complex gadgets and to learn methods which demand little more than common sense and steady gentle hands.

* Presidential address to the British Orthopædic Association in London on Oct. 29.

I am convinced that the standard of the treatment of fractures in this country will correspond with the clinical work and the personal influence of the members of this association; for the doctors of the country will seek advice and teaching from men whom they trust and respect, and are always ready to send their patients to a hospital which they know to be first-class. It is for each of us first to spread the knowledge of a safe system of splintage throughout his district, and secondly to set a very high standard in the work of his own hospital, work which is undertaken in clinical alliance with the staff of every department of the general hospital. Indeed he and his whole unit form one member of the diagnostic and therapeutic team of the region.

This should lead to a natural growth of service in accord with the trend, training and interaction of the medical profession. Therefore it should work. And I hope it will be backed, expertly inspected, encouraged, criticised and even disciplined through some regional organisation. I have little doubt that such a development, given financial support and the coöperation of our profession, will be welcomed by the administrators, medical superintendents, and governing bodies of the hospitals.

ORTHOPÆDIC LEARNING

If we orthopædic surgeons insist that the general practitioners and the staff of the reception hospitals shall give primary treatment to fractures on the lines I have suggested, and transfer difficult fractures, particularly those in which the function of the joints may be damaged, it is only right that we should give time and thought to these matters as they concern our own methods in our own hospitals.

Orthopædic surgeons see the seamy side of the life of the locomotor system; we grow familiar with every kind of failure and disaster, our own and those of our neighbours; we see delayed union, non-union, malunion, secondary arthritis, stiff joints, and, worst, of all the end-results of traumatic or early post-traumatic ischæmia. Some of these conditions are so distressing and incurable that it is natural that we should try to trace the cause in each case and consider how the failure could have been avoided. When we do this we find that the great majority of bad results are due to a lack of knowledge, of dexterity, of gentleness, or of sustained interest in the aftercare. But our native job is the restoration of the disabled patient to activity. That is the difficult task on which we sharpen and temper our orthopædic wits, until we become able to perceive what is best for each case and how to achieve it. It is a life-long apprenticeship. As we become familiar with the ways of the living tissues which are the materials of our craft, we understand how to get them to work with us and not at variance. If we want the cells to be active, we supply them with plenty of blood of good quality; if we want bone, we push the matrix; if tendon, we pull it; if resilient fibrocartilage, we move the parts over a wide range without weight-bearing for many weeks. We have been directed toward this knowledge by the insight of Samuel Butler, and by the research and practice of those *Menders of the Maimed* who were immortalised by Sir Arthur Keith in the orthopædic surgeon's bedside book.

If we have set ourselves to understand our craft we owe that wholesome attitude of mind to the tradition set by Robert Jones, Osgood and the other leaders of this association. They have made us mobile and teachable, impressing upon us that we must meet regularly, travel widely, and discuss freely. We meet regularly and so form a society of friends, eager to talk shop and swap ideas; we travel widely to see the work of other men at home and abroad; and we discuss freely in a spirit of mutual understanding and goodwill, seeking the truth without fear of offending one another, showing our failures and confessing our difficulties.

ACTIVE HYPERÆMIA

We know, and we must go on telling others, that the avoidance of constriction in the region of a fracture is not enough. There must be room for the expansion of tissues in which repair is proceeding; the cells of the callus matrix need a plentiful supply of blood from which they can extract what they need, their food, their building materials, and such vitamins and hormones as are essential for their constructive activity. One has only to realise what is happening round a recent fracture to become aware of one reason why there is so much delay in union in these days of skeletal traction.

POWERFUL PERSISTENT TRACTION

There has always been a potentially harmful factor inherent in the method of weight-and-pulley traction but much actual harm has been done since skeletal traction has made it possible to use heavier weights and to leave them at work for long periods. H. O. Thomas taught from his practical experience that fixed extension on a Thomas splint was better than weight-and-pulley traction. The regular and rapid healing which Thomas achieved by the classical use of his bed-splint is proof of the virtue of that form of splintage which maintains length but does not maintain traction, and allows scope for the hyperæmia which is part of the natural reaction to trauma. This for him sufficed, for he knew little of the virtue of muscular activity round the fracture which adds a physiological source of hyperæmia; to him rest of the parts was the condition under which healing could proceed without disturbance. He would have been horrified by the powerful, unrelieved, stretch which skeletal traction can impose upon the tissues round a fracture.

Think of it for a moment! The continuity of the bone is broken, skin and muscle are relatively elastic and therefore the stretching force is applied to the infiltrated periosteal and other connective tissues round the fracture, tissues swollen and angry with reaction, alive with young mesoblasts, and amply supplied with blood. This is to become the callus matrix, a proliferative mother tissue, ready to bring forth bone to heal the fracture. The pull of a heavy weight which remains in just as powerful operation after the normal length of the part has been reached, inevitably provokes a reflex protective and persistent spasm of the muscles. Stretched by the weight and starved by the muscular spasm, the tissues round the fracture change from a vascular matrix to barren, white fibrous tissue. It is small wonder fractures thus treated unite very slowly, if at all.

This frustration of healing is in sharp contrast to what happens with a Thomas splint correctly used. The restoration of anatomical length is obtained by almost momentary pulls repeated once or twice a day with plenty of time between for the proliferation of the pre-osseous tissue. The muscles are comfortably at rest. With the flexion piece of Maurice Pearson (Natal) added, the principle of fixed extension is preserved, and a wide range of movement made available.

That continuous mild traction can give good results has been proved by Pridie, who has gone so far as to say that every fractured femur should be put up in a Russell traction with a 10 lb. weight for the first two or three days and a 5 lb. weight subsequently. But surely the Thomas-Pearson-Balkan frame combination (TPB for short) is much to be preferred, both because the fracture is accurately held in length and line, and because movement of the knee is safe at an early stage through its admirable control. Fixed extension is employed by separate pairs of adhesive strapping; one pair is applied to the thigh and attached to the end of the Thomas, the other to the leg and attached to the end of the Pearson. The whole limb is visible, comfortable, and in turns restful and active; indeed the contraption supplies the patient with a working toy—and after the first few days he is taught to play with it off and on all day, synchronising the action of cord and quadriceps.

FRACTURES INVOLVING JOINTS

Difficult articular fractures fall into two groups: (1) those in which there is difficulty in restoring the shape of the articular surface, and maintaining it without allowing the joint to become stiff; and (2) those in which the difficulties are due to avascular necrosis of a fragment.

Fractures of the articular table of the tibia and fractures involving ankle or subtalar joint are good examples of the first group. In both these the indications following a good reduction are to protect the articular surface from weight-bearing or other distorting force for a long time, and yet to initiate movement soon.

In fractures of the articular table of the tibia I have found the method of reduction described by Kindersley very good, and am sure that this should be tried before

deciding on open operation. Three factors contribute to reduction, an Esmarch bandage round the head of the tibia, strong traction, and the repeated mild blows of a mallet round the fracture through the bandage. Once reduction in full extension has been achieved, the Thomas-Pearson-Balkan combination is set up, and after four or five days' rest at about 170°, movements are commenced, for the first few days slow and passive, morning and evening, then by the cord and active contraction of the quadriceps. Here we have freedom for muscular, articular and vascular activity; and a treatment in every way preferable to immobilisation in plaster-of-paris and the stubborn stiffness of the knee which follows.

TARSAL FRACTURES

Almost all the tarsal fractures involve joints, and in all after reduction we naturally desire early movement and protection from weight-bearing strains until the danger of secondary deformity is over. There is a simple way I have been using lately to allow the patient to walk with free movement of knee, ankle and subtalar joints.

The leg is in plaster from knee to ankle with the bars of a walking iron spread well clear of the foot, which may be free in a short sock and slipper, or be held in a low plaster shoe with sufficient gap between the two plasters to allow movement of the ankle and subtalar joints. The shin and the head of the tibia need careful padding and moulding and an inverted V is cut over the tendon behind. I have found it impracticable where there is much subcutaneous fat. The patient's weight is transmitted to the leg, and he can be taught to move the ankle naturally as he walks.

The method is very simple and I hope that it will be found helpful in fractures of the os calcis and of other bones of the foot, as well as of the tibia and fibula in the neighbourhood of the ankle-joint. It offers free movement with safety at a very early stage, how early must be decided in each case.

SCAPHOID GRAFTING

McMurray has told us, and I think that many of us go a long way towards agreement, that a scaphoid of the right shape and size, united or not, is a good scaphoid: and that a scaphoid of the wrong shape, united or not, is bad (there are, of course, degrees of badness). Is it not true that late disability in this fracture is confined to cases with limited movement, particularly limited extension? If this is so, is not reduction, if it can be accomplished at this late stage, far more beneficial than bony union, and particularly reduction which will restore full extension?

Are we not beginning to see that the possible indications for grafting are confined to (1) an early case in which after two or three months a series of radiograms has shown that exact reduction, followed by accurate immobilisation, is not achieving union, and (2) a late case with disability after a deformity has been reduced? And how far even these conditions warrant grafting cannot be settled until we know whether union is any better than non-union, and if so, how much; and whether mal-union is better than mal-non-union. These are questions to which our fracture committee might well turn its attention. We cannot expect definite answers to such sweeping questions, but we can hope for a clarification of our conception.

I think that the field for grafting will be confined to a very small proportion of cases, and will exclude those in which there is evidence of secondary arthritis. Furthermore, in defining the field, it is well to remember that the operation, even in practised hands, is neither always successful nor devoid of risk of carpal damage.

It seems likely that most of the cases with a late disability associated with limited movement are due either to non-reduction and a faulty shape, or to non-diagnosis and a lack of rest during the period of reaction. If then we accept McMurray's conclusion, or even regard it as a valuable hypothesis, it seems worth while to remember and practise the method used by Sir Robert Jones of manipulating the wrist into full dorsiflexion and retaining it in plaster for three months, during which period active use of the hand is encouraged. When we do this we should aim at the reduction and close apposition of the parts.

Since an ill-fitting scaphoid commonly causes obstinate pain and disability in manual workers it is very desirable that those responsible for the primary plaster should make sure that reduction is good by radiography, and afterwards take steps to avoid disturbance of the immobilisation during radiography. The young granulation tissue beginning to penetrate the avascular fragment is very delicate, and can be torn by an inadvertent passive movement of the wrist. For this reason removal of the plaster must be accomplished with the utmost care, and the surgeon or sister who has made the plaster ready for removal should go with the patient to the X-ray room and guard the wrist from any movement. This care is necessary at each change until union has been achieved; and those who take these precautions will see few non-unions, and, we can safely prophesy, even fewer cases of subsequent pain and disability.

ATTRACTIVE OPERATIONS—ATTRACTIVE FOR SURGEON OR PATIENT?

As today I am free to give advice, I would recommend great restraint in the performance of the more exacting and therefore attractive operations; and suggest that we should be very critical of new operations, examining their claims closely in the light of biology and physics, and so reach a clear conception of their virtues and indications. Particularly is this so when they carry a risk of doing harm if imperfectly performed, as in scaphoid grafting; and it is even more necessary when they are dangerous to life, as in anterior grafting for spondylolisthesis. None of us nowadays can doubt the soundness of adequately long and strong posterior spinal graft synostosis for spondylolisthesis in those cases where operative fixation is indicated. It is a sound job; the buttress carrying the weight can be made as strong as the surgeon wishes; the operation is straightforward and involves technical procedures which are commonly and frequently performed by orthopædic surgeons. The alternative approach from the front is relatively dangerous; it cannot produce a more effective buttress, and it must be extremely difficult to place a graft or grafts of adequate strength exactly where they are required. In a word the operation is rare, difficult and exacting. Now a very good operator can make a rare difficult and exacting operation easy and safe—almost always! Very well! leave him to it if you know a safer and simpler way. A "surgical exercise" on the cadaver will prove your skill to the examiner; you can help your patient better in humbler ways. The surgeon we want for ourselves and our children is one who will not operate if he can attain his purpose by conservative means, and who prefers a safe and simple operation to one which is attractive to perform, though perhaps a little dangerous.

INTRACAPSULAR FRACTURES OF THE NECK OF THE FEMUR: THE REDUCTION AND THE RESULT

In the past the great majority of these fractures failed to unite; this is still true even of those that are pinned, though here the majority will no doubt be smaller. I am, of course, referring to the total number in which pinning has been carried out; for we know that in skilled hands the majority unite. Imperfect reduction is probably the most common cause of failure, closely followed by subsequent loss of position due to faulty technique in the pinning operation, to faulty placing of the pin or to subsequent difficulties associated with avascular necrosis. It would be very interesting to find out the facts; the fracture committee of the association might well consider an inquiry not confined to work in orthopædic hospitals or other accident services, but on a basis which would take in all hospitals and nursing-homes within the area investigated, in order that the total number of cases pinned, and not a selected group, should furnish the data.

In the meantime we shall not be wrong if we broadcast our conviction that accurate reduction comes first, not only in time but also in importance, because it is the only way of bringing the whole area of the two broken surfaces into contact. I do not, however, advocate the breaking up of an impaction (with a touch of external rotation) provided that it gives an adequate area of contact; indeed the preservation of impaction is often the quickest, surest and most acceptable treatment.

Smith-Petersen's pin with its exquisite design and the various ingenious gadgets which mechanise its insertion, have tended to put accurate reduction off the centre of the stage, which is its proper place. But once the fractured surfaces have been brought together the aim of Whitman and Smith-Petersen is identical—namely, to maintain this intimate apposition. What Whitman did with plaster can only be copied by the disciples of Smith-Petersen if we make sure that the pin is so placed that it has the strongest possible purchase on the head and is inserted without the least tilting or diastasis of the fragments. The slightest technical error can completely spoil a perfect reduction by a little tilt or separation; therefore no-one should complete the operation without making sure of the exact position of the pin, and the intimate apposition of the fragments, after the last blow of the hammer, by final anteroposterior and lateral radiograms.

There can be no doubt that in subcapital fractures a tibial graft above the pin gives additional security; the value of the graft is enhanced when the creeping substitution in its neighbourhood proves speedier than that round the pin, because the periods of feeble hold of the graft and of the pin do not coincide.

Intracapsular fractures unite only by direct contact; that is my point, the union of an intracapsular fracture depends absolutely upon a reduction which is subsequently undisturbed. Such an achievement makes union certain, though when the head is avascular the contact must be maintained much longer—and that is where plaster fails. On the other hand Kemp, our consulting radiologist, assures me that, from a comparison of X-ray films of cases pinned with those of others treated by conservative means, he suspects the Smith-Petersen pin of being a potent killer of heads; and he tells me that Brailsford shares this view. Their conclusion would, no doubt, be tested if the inquiry I have suggested is undertaken. But the observation might well have been reached by deduction, for the pin as it cuts its way into and through the centre of the head must play havoc with its intrinsic vascular system. Is the pin doing for old heads what Lorenz did for young ones?

I am inclined to think that here again there may be a field for conservative treatment. We know that excellent reduction will often follow a few days on Russell traction or the TPB; and, since it has been our practice hitherto to pin the fracture at this time, we know that the reduction is not easily disturbed by the lifting and moving that are necessary preliminaries to pinning. Does not this suggest that after accurate reduction—the first and absolute necessity in any case—prolonged use of Russell traction, or better of the TPB, would give results comparable with those of the pin? These two methods of splintage exert a pro-anatomical influence which depends mainly on mild traction in the presence of slung flexion of the knee which controls rotation; and their trial would represent a very natural swing of the pendulum, by no means back to the discomforts and the mortality of the Whitman plaster, but to an equally reliable and much more acceptable means of maintaining reduction, with the patient free to sit up in bed, and move his knee. One would insert a pin if signs of avascular necrosis should appear.

THE DEAD HEAD

Avascular necrosis with all its delay and trouble, occurs in a considerable proportion of high fractures which have been pinned, however expert the operation. We have, therefore, to X ray these cases at intervals month after month to ascertain whether the head is alive or dead. If relative hypercalcification appears we know that it is dead and see danger in the offing. This danger begins with the softening of the bone close to the fracture line and spreads until, months later, the cortex can be crushed. The patient is now put into a weight-bearing calliper and warned to avoid any wrench of the hip, such as the sudden lifting of his calliper-laden limb on to a sofa by muscular effort. It may be necessary to explain to the bewildered victim why he finds himself at so late a period hedged round with new warnings and condemned to a calliper for a very long time. For there are five stages through which a dead head must be guarded on its way back to life and strength: invasion by vascular granulations; colonisation; absorption of the old trabeculæ, which were built to carry the weight of the body; replacement of strong bone by primitive spongy bone with spicules that are feeble but cell-controlled and therefore responsive; finally retrabeculation, a response to re-education by graduated function. Dangers beset the head at every stage, concerning first its union and then the integration of its structure. Invasion and recolonisation require good reduction and perfect immobilisation so that the granulations may pass directly and continuously from the living to the dead bone: granulations cannot cross a gap if the dead surface is washed by synovial fluid, for they have no amphibious equipment. Then come the stages of special delicacy and danger when the strong old bone is being replaced by soft new bone which is for a time quite unfit to carry much strain, far less the weight of the body. This period begins some months after the fracture, and lasts for at least another 18 months. It is as if the dead head had to be melted down and recast, but the living process is very, very slow—Phemister rightly named it "creeping substitution."

With such gradual biological processes as I have been describing, and which are necessary to the healing of other injuries, the orthopædic surgeon is at home; for if he is worth his salt he has learnt a due regard for the living reactions of the connective tissues. He knows the conditions they like, the time they need for their various activities, and how their help can be encouraged and directed: he has followed Sir Arthur Keith's advice in cultivating "a close acquaintance with the behaviour of osteoblasts."

THE HOSPITAL AND THE PATIENT

A gentle kindness is the natural response of nurse and surgeon to a patient in distress; it is easy when all he needs is to be tucked up snug and warm in bed and put to sleep, but difficult when treatment demands the unwelcome contact of splint or plaster. The mercy of an orthopædic hospital must be very practical, like that of the Good Samaritan. But it will only be effective if it is based on skill hardly won and generously given by men and women who have taken pains to acquire an intimate knowledge of their work, and are unsparing of time and trouble, day after day, to ensure the exact adjustment of the splintage and the comfort and well-being of the injured part. Loving-kindness put into the effective care of little things graces the work of such a hospital. Then rest comes gently to a broken body and reassurance to a shaken mind.

NAPT SCHOLARSHIPS IN SOCIAL WORK.—The National Association for the Prevention of Tuberculosis is offering two scholarships of £25 each to help suitably qualified women to obtain experience in the social side of tuberculosis work. Candidates will be selected by the association with the advice of the institute of Hospital Almoners, and qualified almoners and students in their last year of training with the institute should apply before Dec. 10 to Dr. Harley Williams, NAPT, Tavistock House North, London, W.C.1.

FURTHER FACILITIES FOR TREATING THE INJURED WORKER.—Since 1941 a large proportion of workers have been eligible for treatment in hospitals or centres of the Emergency Hospital Scheme when they sustain fractures, whether in the course of their employment or not. Since last April they have included manual workers in all factories, and those engaged in building, civil engineering, mining, agriculture, fishing, public utility undertaking, shipping and transport, together with whole-time Civil Defence workers. Circular 2876 of the Ministry of Health states that these workers will henceforth be eligible for the treatment not only of fractures but also of (1) dislocations, sprains, displacement of semilunar cartilages, and other injuries requiring the specialised attention of orthopædic surgeons (including those involving nerves or tendons or severe injury to soft parts); (2) injuries to the head (and their sequelæ) ordinarily treated at head centres in the Emergency Hospital Scheme; and (3) burns severe enough to require inpatient treatment. The extended service is not intended to apply to minor injuries which do not need the advice of a specialist.

A revised list of orthopædic centres, fracture departments and fracture clinics has been issued.

EFFECT OF ALTITUDE ON CASES OF PNEUMOTHORAX

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With Comments on the Electrocardiograms by

D. M. ANDERSON, MD EDIN, MRCPE
WING-COMMANDER RAFVR

FOR some time before the war air transport was being increasingly used in civil life; and since the outbreak it has proved valuable for the transport of wounded to the base. Some of these have chest wounds associated with pneumothorax or hæmopneumothorax; and, wounded apart, there are a few pilots in the RAF, thoroughly trained and valuable to the country, in whom artificial pneumothorax has been induced as a treatment for pulmonary tuberculosis. It therefore seemed useful to study the effects of altitude on pneumothorax so as to decide: (1) the optimum height for the transport of wounded with this condition, and (2) the height at which a pilot with an artificial pneumothorax can safely undertake flying duties.

Air transport is comfortable, and air-ambulances are now in use in all the belligerent countries. In order to find both the optimum flying height for chest cases and the necessary adjustments to be made before or during the flight a series of experiments were carried out in the low-pressure chamber on the reactions of cases with pneumothorax to varying altitudes.

Boyle's law states that if the temperature remains constant the volume occupied by a given quantity of gas varies inversely as the absolute pressure exerted on it; or conversely, if the gas cannot expand, the differences of pressure correspondingly increase. In applying this law to the experiments which follow I have had to allow for the mobility of the mediastinum, the presence or absence of pleural adhesions, or the presence or absence of adherent lobes of the lung.

It was well known in the old days that a patient with an artificial pneumothorax ascending to the Swiss sanatoria, situated between 4000 and 6000 feet, became dyspnœic and often needed some air taken off on his arrival; and the converse held when he descended at the end of his sanatorium treatment. I thought it would be a good thing to study, by screening and films, the effects on various types of pneumothoraces.

MATERIAL AND METHOD

A group of 4 cases were selected, 2 right-sided and 2 left-sided pneumothoraces. Case 1, right-sided, was a complete pneumothorax with a mobile mediastinum; case 2 had a partially fixed mediastinum with a large apical adhesion; and of the left-sided cases, case 3 had a mobile mediastinum with an apical adhesion, and case 4 a completely adherent left upper lobe with the mediastinum fixed in its upper part and mobile in its lower third. In both left-sided cases a trace of fluid was present at the base. I chose the same type of case on the two sides in order to see whether vascular changes would be greater on the left than on the right owing to the increased pressure on the heart and great vessels.

Experiments in the pressure chamber were conducted under the following heads:

1. Clinical changes.
2. Radiological changes.
3. Electrocardiographic records.
4. Changes in vital capacity.
5. In the first 2 cases, analysis of the alveolar air at various heights.

EXPERIMENTS

The first experiment on the right-sided pneumothoraces was carried out on May 14, 1942. For convenience I shall write of the changes of pressure as if they were changes of height. Each patient was taken in separately: at the start, while at ground level, the electrocardiographic apparatus was attached, the patient was seated comfortably on a stool, the X-ray equipment was placed in position and the vital capacity machine was to hand. It was decided in the first cases to climb 500 feet a minute and to take tests of the vital capacity, the electrocardiogram and the alveolar air, together with an X-ray screening and photograph, at 2000, 4000, 6000 and 8000 feet and then every 1000 until the maximum height to which we thought it safe to take each patient had been reached.

Table I shows the height, the vital capacity and the alveolar partial pressure of cases 1 and 2 (case 1 with a mobile mediastinum and case 2 with a fixed mediastinum), and fig. 1 compares the alveolar pressure of the two cases with that of a normal subject.

At the various heights mentioned, both on ascending and descending, the patient was screened in expiration and inspiration at 2000, 4000, 6000, 8000 and 9000 feet and was X-rayed in deep inspiration at the same heights.

Clinically, case 1 showed no ill effects until a height of 8000 feet, when he complained of a tight feeling in the chest and a pull on his right apex on breathing. At 9000 feet his pain became acute and thus it was decided to cease the ascent. The screen examination of this case in expiration at 9000 feet showed a great pull of the mediastinum to the left with congestion of the whole of the left lung.

Case 2, with the fixed mediastinum, behaved clinically in a different manner. His symptoms began at 6000 feet when he commenced to feel slight dyspnœa and some pain over the right border of the sternum at the level of the second rib anteriorly. At 8000 feet the dyspnœa was worse and the pain more acute. The great veins in the neck began to be noticeable. At 9000 feet the pain had increased and the congestion of the great veins was considerable. The pulse-rate as shown by the electrocardiogram had increased considerably. The ascent in this case was terminated at this level.

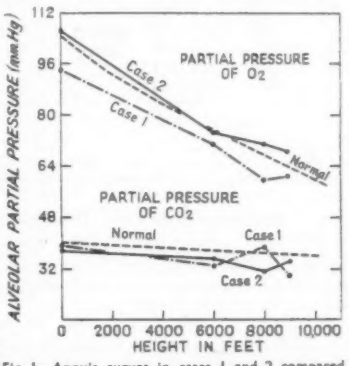


Fig. 1—Anoxia curves in cases 1 and 2 compared with those of a normal subject at various heights.

The screen findings at ground level and at 6000 and 9000 feet in both inspiration and expiration, of cases 1 and 2 are shown in fig. 2, and the radiograms of case 1, taken in full inspiration at the various heights, in fig. 3. The radiograms of case 2 are shown at ground level, 6000, 8000 and 9000 feet (fig. 4).

Screen examination (fig. 2) proved, in this experiment, more significant than the film. It showed not only the striking difference in the amount of collapse between inspiration and expiration, but in case 2 displayed to better advantage than the radiogram the large hernia of the anterior mediastinum which developed, especially at the higher altitudes—for example, at 8000 and 9000 feet.

With cases 3 and 4, the left-sided pneumothoraces, it was decided to ascend at a slightly faster rate in order to ascertain whether rate of climb made any appreciable difference. It was also decided in this experiment, which took place on Aug. 27, 1942, to take the pressures of the pneumothoraces at ground level and at the peak of the ascent, the manometer having previously been adjusted to give comparable pressures at this height and at ground level.

It was decided on this day to take up a 5th case, that of a spontaneous pneumothorax who still had a small bronchopleural fistula present—proved by a previous analysis of the air in his pneumothorax. Table II shows the time taken and the various tests carried out at the various heights. The results of screening are not shown, as they agree with the radiograms taken in both expiration and inspiration. Radiograms at ground level, 6000 feet and the peak of the ascent, both in inspiration and expiration are shown in fig. 5. In case 5 the radiogram at ground level and 6000 feet, during inspiration and expiration, are shown in fig. 6; the screening did not differ from these findings. It will be noted that despite the presence of the small bronchial fistula in case 5 the underlying lung collapsed as the ascent proceeded and at 6000 feet the patient felt pain and was slightly dyspnœic. It was decided to end the ascent at this level.

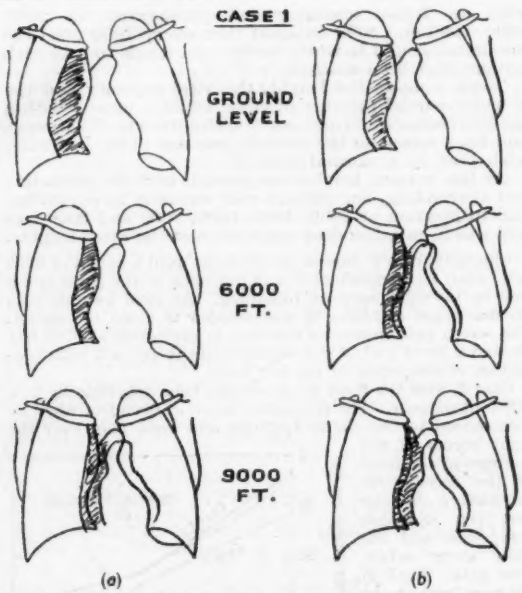
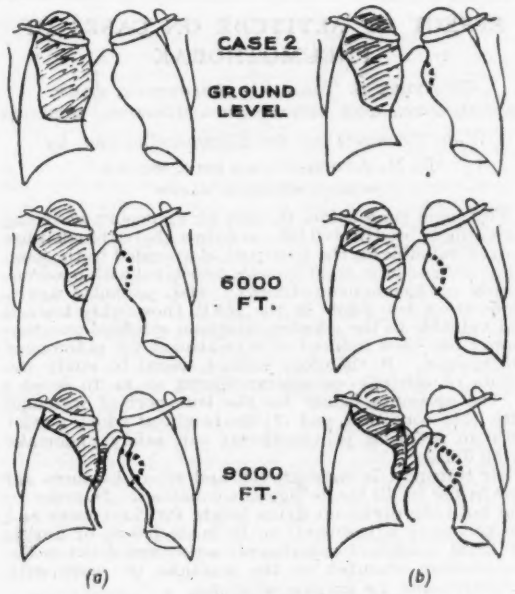


Fig. 2—*Results of screening* (cases 1 and 2): (a) inspiration; (b) expiration. Case 1: First pair, ground level; 2nd pair, 6000 ft.; 3rd pair, 9000 ft.



Case 2: 4th pair, ground level (anterior mediastinal hernia); 5th pair, 6000 ft.; 6th pair, 9000 ft. (anterior mediastinal hernia much longer).

Electrocardiographic Tracings of the Cases

(WING-COMMANDER ANDERSON)

CASE 1.—No significant change apart from minimal right axis shift. There was increased amplitude of the P waves, due to the increased rate.

CASE 2.—No significant change. Slight right axis shift of 10°, increase in rate with prominence of P and inversion of T3, all attributable to slight torsion of the heart produced by the mechanical effect of increased tension in the left chest in a person with a fixed mediastinum.

CASE 3.—No significant change apart from increased prominence of inverted T waves at altitudes of 7500 feet.

CASE 4.—No significant change, but it is noteworthy that the configuration of the chest lead was absolutely constant and unchanged throughout, although the underlying heart moved a distance of about 2 in. from left to right, the lead

TABLE I—EFFECT OF ALTITUDE ON PNEUMOTHORAX CASES

Case	Height (ft.)		Vital capacity (c.cm.)	Alveolar partial pressure mm. Hg	
				CO_2	O_2
1. R.-sided; mobile mediastinum	Ground		2550	36·9	94·0
	Ascent 500 ft. per minute	2000	2525	..	..
		4000	2350	..	..
		6000	2200	33·2	71·2
		8000	2050	38·2	59·8
		9000	1600	29·8	60·7*
	Descent	6000	2250	..	..
		4000	2350	..	..
2. R.-sided; apical adhesions, partly fixed mediastinum	Ground		2925	35·6	106
	Ascent 500 ft. per minute	2000	3000	..	..
		4000	2800	..	..
		6000	2550	34·6	74·7
		8000	2500	31·7	71·1
		9000	ND	34·0	68·7
	Descent	6000	2500	..	..
		4000	2750	..	..

ND = Not done owing to condition of patient. * Doubtful.

TABLE II—EFFECT OF ALTITUDE ON PNEUMOTHORAX CASES 3, 4 AND 5

Case	Height (ft.)		Time of ascent and descent (min.)	Effect
3. L.-sided; mobile mediastinum; trace of fluid	Ground		Zero	Pressure: 0, —5.
	Ascent	2000	4–5	..
		4000	8–11	Pulse 78. Beginning to feel a pull.
		5000	13	..
		6000	15–29	Pulse 78. Resp. 20. Pull still present. Sl. short breath. Pressure: 0, +8.
		6500	30	..
		7000	32–41	..
		7500	42–52	Pulse 80. Some pain in chest. Feeling tight. Pressure: +3, +8.
	Descent	6000	56–59	Pain easier.
		4000	62	Slight pain only.
	Ground		67	..
4. L.-sided; adherent apex, partly fixed mediastinum; trace of fluid	Ground		Zero	Pressure: —4, +2.
	Ascent	2000	2–5	..
		4000	7–11	..
		6000	14–19	..
		7000	21–23	..
		8000	26–32	Feels lump in throat as at refills. Pressure: +10, +15. Tight at base.
	Descent	6000	34	..
		3000	39	..
	Ground		43	..
5. R.-spontaneous pneumothorax with broncho-pleural fistula	Ground		Zero	..
	Ascent	3000	3–6	..
		6000	11–16	..
	Descent ground		26	..

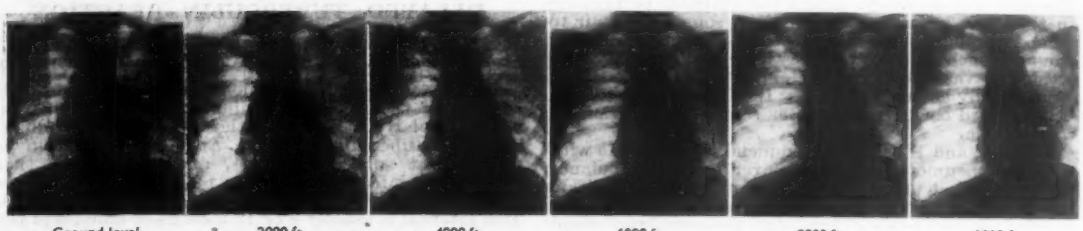


Fig. 3—Radiograms of Case 1 taken at full inspiration at various heights.

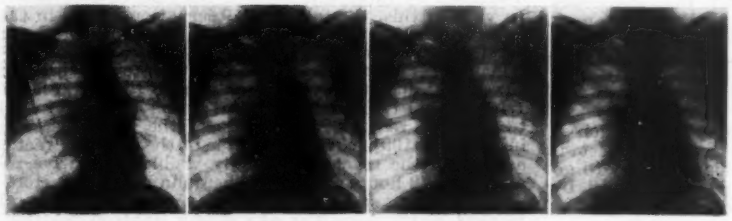


Fig. 4—Radiograms of Case 2 on full inspiration at various heights.

originally lying approximately over the left side of the right ventricle at ground level and about ½ in. beyond apex at 7500 feet.

Though there was appreciable mediastinal movement with increased altitude demonstrable by X rays, the change in the electrical axis was negligible in all cases, the greatest shift being noted in the case where the mediastinum was fixed. This suggests that torsion, rather than lateral movement, is responsible for change of electric axis. The fact that, in 3 of the cases, the T waves were almost iso-electric at ground level, with a tendency to become either biphasic or inverted at altitude, might explain the T wave inversion in all leads at ground level in the remaining case. In this —case 4—neither the clinical findings, the X-ray configuration of the heart nor the remaining complexes of the electrocardiogram provided evidence to suggest the presence of myocardial disease.

Discussion

From this experiment it is possible to draw conclusions about the optimum heights to which a patient with pneumothorax can fly, the necessary precautions to be taken in transporting wounded, and the instructions to be given to a pilot flying with an artificial pneumothorax.

It is dangerous to fly cases of tension-pneumothorax at any height until a needle has been put in position in the chest wall to allow the air under pressure to escape; and it is essential to leave this needle in position during the whole of the flight. It is a well-known rule that cases of open, sucking pneumothorax, due to wounds, should have the wound closed at the earliest possible moment. In these cases, when it is necessary to fly to the base for further treatment, this presents difficulties. No-one doubts the necessity for making an open pneumothorax a closed one as soon as possible, but if a flight is to be undertaken after this and the height of the flight is over 5000 to 6000 feet, it will either be necessary to place an intercostal tube in position before the flight starts, or, if this is not possible, a doctor must accompany

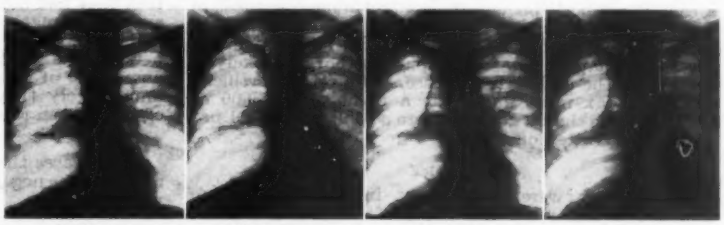
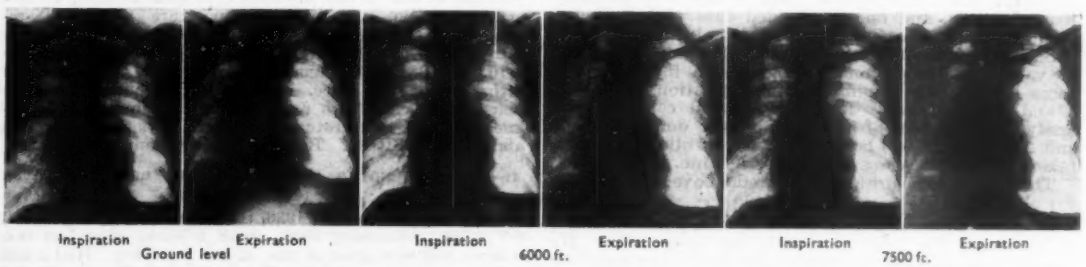


Fig. 6—Radiograms of Case 5 on inspiration and expiration at ground level and at 6000 ft.



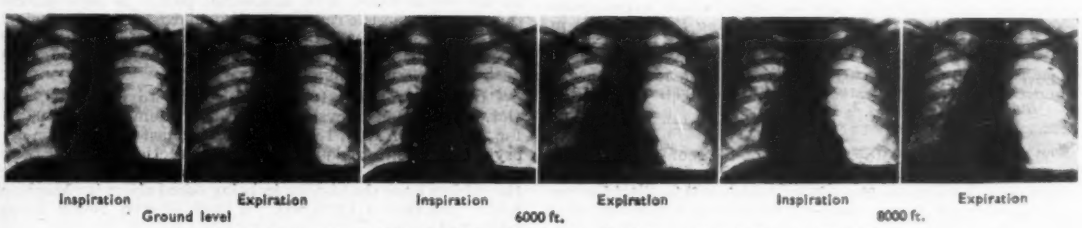


Fig. 5—Radiograms of Case 3 (above) and Case 4 (below) on inspiration and expiration at various heights.

the case and be ready, should the dyspnœa or pressure in the chest become acute, to allow some of the air to escape through a needle. If the open pneumothorax wound is such a size as to necessitate covering only with a sterile vaseline-gauze dressing, this can be lifted momentarily at height to allow the excess air to escape, being placed back in position as soon as the patient is comfortable.

Lovelace and Hinshaw[1] recommend that patients with a tension pneumothorax should never fly in an ambulance above 3000 feet unless the proper equipment to aspirate air from the pleural cavity is present. It has been pointed out by Lovelace[2] that some patients do not stand aerial transport well if heights in the neighbourhood of 10,000 feet are necessary. Pneumothorax cases may have their pressure increased so much that disastrous effects on the collapsed lung and mediastinum may ensue, and he states that in countries such as the British Isles the disadvantages of aerial transport may outweigh the advantages in cases such as this.

CONCLUSIONS

If possible, no patient with a wound of the chest causing pneumothorax should go above 4000 feet if transported by air to the base. If it is necessary to go to greater heights the pressure should be adjusted by removing as much air as possible before the start of the journey.

In cases of tension-pneumothorax due to escape of air through a lacerated lung it will be necessary to place a needle or an intercostal catheter in position, in order to control the pressures during the flight. Pilots, or passenger personnel, with an artificial pneumothorax, should not fly by aeroplane at the most above 6000 feet for any length of time and should on no account, even for a few minutes, go above 8000 feet.

Those with a mobile mediastinum appear to stand altitude better than those with adhesions or a fixed mediastinum, in whom there is always danger of rupture of an adhesion.

By disregarding the underlying lesion in the lung in a case of artificial pneumothorax and removing most of the air before the ascent it is possible to allow the patient to fly higher; but this is to be deprecated, since expansion of a lung collapsed by artificial pneumothorax is likely to exacerbate the underlying disease. If a case of artificial pneumothorax must undertake a flight up to 8000 or 10,000 feet, he should go just before a refill is due, and not immediately after one.

SUMMARY

Experiments were carried out in the low-pressure chamber to ascertain the effect of height on various types of pneumothorax.

Two right-sided cases, one with mobile (case 1) and the other with partially fixed mediastinum (case 2) and two left-sided cases, one mobile (case 3) and one partially fixed (case 4), and one right-sided case with bronchopleural fistula (case 5) were taken as subjects.

Screening in inspiration and expiration was carried out at various altitudes, and radiograms in inspiration in cases 1 and 2 and inspiration and expiration in cases 3, 4 and 5 were taken. Readings of vital capacity and analyses of samples of alveolar air were done in case 1 and 2 at the various heights. Electrocardiograms were taken in 4 of the cases at various heights.

The conclusions drawn are stated above.

I wish especially to thank Prof. B. H. C. Matthews, FRS, D SC, and Air-Commodore A. F. Rook, OBE, RAF, consultant in medicine, for their great help and coöperation. My thanks are also due to the medical personnel of the Royal Air Force for their valuable help in making these experiments possible and to Dr. G. M. Little for taking the pressures in the chamber.

1. Lovelace, W. R. and Hinshaw, H. C. *War Med.* 1942, **2**, 580.
2. Lovelace, W. R. *Proc. Mayo Clin.* 1941, **16**, 221, abstracted in *Bull. War Med.* 1942, **2**, 238.

The library of the Royal College of Surgeons in Lincoln's Inn Fields has benefited by the gift from the Rockefeller Foundation of a micro-film reader, which will facilitate access to original work done abroad and at present difficult to come by in this country.

DELAYED TUBERCULIN REACTION

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PROPHIT SCHOLAR OF THE ROYAL COLLEGE OF PHYSICIANS

IN tuberculosis surveys which include tuberculin tests as part of the routine examination, it is common to retest regularly at least all those persons who fail to react to tuberculin. Where a positive reaction is recorded at subsequent tests, one can assume that tuberculous infection has taken place between the date of the last negative test and that of the first positive. This interval is usually 6 or 12 months or more, and the presumed date of infection can then only be a rough approximation. Thus tuberculous infection is rarely diagnosed by tuberculin tests at the time of occurrence. In view of this, the following observations made in the course of the Prophit tuberculosis survey appear to be of particular interest.

A number of persons who failed to react to either of the initial injections of tuberculin (0·1 c.cm. of OT 1/10,000 and 1/100) have, several weeks after the initial test, had a reaction at the site of the last tuberculin injection (1/100). The reaction is of the same character as that of the reaction normally visible in positive reactors 48–72 hours after the tuberculin injection. Moreover, it leaves a mark which may persist for several months, in the same way as a strong Mantoux reaction.

The reaction is not of the same type as the "torpid" reaction described by Pirquet (1909). The torpid reaction appears a few days later than the reaction normally observed, and was believed by Pirquet to indicate the existence of an old tuberculous lesion in the process of healing. Reactions of this type also have been seen in the survey.

Many of the delayed reactions pass unnoticed. During the past year, since this possibility was kept in mind, characteristic marks have been observed at the site of previous injections of OT 1/100 in people presenting themselves for retest 6 months or more after previous negative test; 5 of these, on being questioned, stated that they had noticed the reaction, and were able to give an approximate date of first appearance. The others had not noticed it. As routine procedure, therefore, all persons not reacting to tuberculin are now told of this possibility of delayed reaction, and are asked to report immediately they note any such reaction. One such case has been reported.

CASE-HISTORIES

In 14 cases the last Mantoux test before the delayed reaction was negative, and the test following the reaction was positive.

I—REPORTED AT THE TIME OF REACTION

CASE 1.—On Sept. 2, 1942, and Feb. 22, 1943, negative to OT 1/100. On April 1, 1943, 5 weeks after the last test, reaction at site of last injection: 10 mm. œdema, 20 mm. erythema. No symptoms. Temperature normal. X-ray examination: nothing abnormal. Blood sedimentation rate (BSR) 19. On April 15, Mantoux test: 2-plus to 1/10,000. BSR 23. Temperature normal. Warded with arthralgia of right knee. Inflammatory reaction round old scar of knee, and pain and swelling of joint. On May 11 knee normal; temperature normal. X rays showed nothing abnormal. BSR 34. Refused further Mantoux test.

II—REACTION NOTED AT THE TIME BUT REPORTED LATER (Cases 2–7)

CASE 2.—On Nov. 24, 1936, and Dec. 7, 1937, negative to OT 1/100. January, 1938, about 4 weeks after last test, œdema and erythema at site of last injection. Had a cold at the same time, with substernal pain. X rays showed round shadow in the right infraclavicular region. On June 2, 1938, Mantoux test: 2-plus 1/10,000. In January, 1939, suspicious shadow, left infraclavicular region. In May, 1939, both shadows much smaller.

CASE 3.—On Aug. 10, 1942, negative to OT 1/100. On Oct. 15, headache; feverish for a week. Temperature 102° F. for 2 days. On Nov. 15, 3 months after last test, œdema and erythema at site of last injection. Reaction lasted 7 days. On Feb. 20, 1943, the mark of the reaction still visible, and the subject gave the history on being asked about it. Mantoux test: one-plus 1/1,000,000. X rays showed round focus, right mid-zone.

CASE 6.—On Aug. 10, 1942, negative to OT 1/100. In May, 1943, œdema and erythema at the site of last injection. On June 5 X rays showed enlarged root glands. On June 28 the mark of the May reaction was still visible. Mantoux one-plus 1/10,000. Patient complaining of cough. On July 16 X rays showed that the hilar glands were larger; there was a lesion at the left apex.

III—REACTION NOT NOTED AT THE TIME (cases 8–14)

Here, in people presenting themselves for retest, a characteristic mark was noted at the site of previous injection, the initial result of which had been negative. The reaction had passed unnoticed.

The main features of these cases are shown in the table.

Case	Interval between last neg. and: Delayed reaction	Interval between last neg. and: First positive	First positive reaction: dilution	Symptoms before or at time of delayed reaction	X-ray findings *
	wk.	wk.			
1	5	32	++ 10,000	Nil	Nil
2	4	26	++ 10,000	Coryza, substernal pain	Round focus (6)
3	13	28	+ 1,000,000	Pyrexia	Round focus (28)
4	16	28	+ 10,000	"Gastric 'flu"	Nil
5	2	28	++ 10,000	Jaundice	Nil
6	39 (about)	43	+ 10,000	Cough	Enlarged hilar glands; focus lt. apex (46)
7	43 (about)	57	+ 100,000	Nil	Nil
8	?	39	+ 100,000	Cough, sputum, pyrexia	Diffuse shadow rt. base (19)
9	?	26	+ 100,000	Nil	Nil
10	?	28	+ 1,000,000	Nil	Nil
11	?	30	+++ 100	Nil	Nil
12	?	24	+ 1,000,000	Laryngitis, pyrexia	Nil
13	?	47	+++ 100,000	Cough	Nil
14	?	26	+++ 100,000	Nil	Nil

* The figures in parentheses show time, in weeks, since last negative test.

In one case observed a delayed reaction occurred in a person originally reacting only to OT 1/100.

CASE 15.—On Sept. 4, 1942, positive to OT 1/100 (i.e., negative to 1/10,000). In January, 1943, contact with tuberculous patients. A week later, erythema and œdema at site of last tuberculin injection. Feb. 22, 1943, Mantoux 2-plus 1/10,000.

All the above cases except one were nurses; case 2 was a medical student. Opportunities for observing this phenomenon have been greatest in the group of nurses, which is however only one of 5 groups included in the survey. Entrants to the survey have a tuberculin test and a chest radiogram once a year for 5 years; where the initial reaction is negative, the test is repeated 6-monthly till positive.

DISCUSSION

Delayed reaction after negative test (cases 1–14).—In all cases but one the test after the "delayed reaction" was positive to small doses of tuberculin (0·1 c.cm. of 1/10,000 or less). In 3 cases a primary focus was observed shortly after the delayed reaction, and in one case a diffuse shadow which may correspond to perifocal infiltration. Out of 7 subjects who observed the delayed reaction, 5 had other symptoms. In case 3, four weeks before the reaction, there were symptoms which may have corresponded to the primary infection. If this is so, the case is particularly interesting, showing the time lag between the infection and the development of allergy.

It is assumed that the delayed reaction observed in the cases reported occurs shortly after an infection, and the reaction to tuberculin still present in the skin occurs at the time tuberculo-sensitivity reaches a definite level. If this occurs often we have a number of possibilities of investigation into the circumstances of primary infection and the reactions of the individual at the time. Primary infection is usually not accompanied by symptoms of any note, and is therefore rarely detected at the time. The delayed reaction described marks the date of infection, or at least of development of sensitivity following infection.

A question arises here: can one say that in these cases tuberculin was retained in the tissues in the absence of previous infection? Or had the infection occurred before the last tuberculin injection, and had allergy developed to a degree high enough for the antigen-fraction of the tuberculin to be fixed intracellularly, but not yet high enough to produce the typical reaction? In the second eventuality, the skin reaction would develop later when tuberculo-sensitivity had reached a high enough level. In cases 3, 4, 6 and 7, however, this appears improbable since in these cases the interval between the last negative test and the delayed reaction is between 3 and 10 months. That a substance like tuberculin can be retained in the skin for a long time is borne out by an observation by Prof. G. S. Wilson (1943):

> A person who failed to react to an intradermal brucellin test, and who contracted undulant fever 2 years later, developed, at the time of the illness, a reaction at the site of the previous brucellin test.

Considering the number of tuberculin surveys carried out in America and Scandinavia, it is curious that cases of delayed reaction have been recorded so rarely. The only published cases found were as follows:

Ianne (1939) wrote: "A student nurse had no reaction to three dilutions of OT until 6 weeks after the tests were done, when definite one- and two-plus reactions showed at the sites of injection. Evidently infection had occurred in the meantime and caused a reaction to unabsorbed tuberculin. A subsequent tuberculin test substantiated the fact that infection had occurred. . . . This bizarre reaction was discussed with Doctor Long and most of the pathologists present, without securing an answer."

Malmros and Hedvall (1938) mention one case in which a reaction was observed two weeks after a negative test, and another case one week delayed. The latter may have been a torpid reaction. Hart, Hilton and Morland (1940) have reported a case which was the first one observed in the Prophit survey, and is reported above (case 2).

Any reason advanced for the relative frequency of the observations in the Prophit survey compared with other surveys must be purely speculative. First, it will be noted that all except case 2 were seen in 1942 or 1943—that is, since a point has been made of looking out for such cases. During the preceding 7 years of the survey, in the absence of special observation, only 1 case had been noted. It is possible then that in other surveys such cases do occur but pass unobserved. Another possibility is that certain tuberculins may be more slowly absorbed than others, and that the tuberculin used in the survey is of such a character.[1] If this is true a wide field of investigation is possible along the lines of preparing a tuberculin which after intradermal injection will remain in situ for a long time, and serve in initial negative reactors as an indicator of subsequent infection.

Wassen (1936, 1938) has recorded experimental work along these lines. A mixture of tuberculin and liquid paraffin was injected into the skin of two previously tuberculin-negative subjects. One subject had a reaction at the site of injection 2½ months later; a Mantoux test then was strongly positive, and the chest X-ray film showed a large shadow in the left hilum. Another subject reacted at the site of injection 6 months later, and the reaction slowly increased in size during the following year.

Delayed reaction after positive test (case 15).—The facts here are not in contradiction to what is known of tuberculo-allergy. It is known that in the presence of massive or repeated contact tuberculin sensitivity can rise from a low degree to a very high one. It has also been shown experimentally that in previously infected animals (Willis 1928) and persons (Saenz and Canetti 1939) whose sensitivity has been reduced to zero or a very low degree,

1. The sample of tuberculin used was prepared on synthetic medium (Douglas and Hartley) and its potency was equal to "international standard. It contains approximately 50% of glycerol.

sensitivity rises after superinfection much more rapidly than after their primary infection. It is therefore not surprising that in case 15 the reaction appeared as early as a week after fresh contact.

Observations of analogous character were made in early experimental work of Klingmüller and Slatinéano quoted by Bordet (1919). When, some time after a previous tuberculin test, tuberculin is introduced into the circulation, the site of local cutaneous or conjunctival reaction frequently shows a new inflammatory process. The "flare-up" ("anflammung") may also be produced by intracutaneous injection of tuberculin in the vicinity of the site of a previous tuberculin test. A similar phenomenon is the flare-up at the site of previous tuberculin tests in the course of tuberculin treatment.

SUMMARY

Delayed tuberculin reactions in 15 cases are reported. In 14 of these, the reaction developed between 2 weeks and 10 months after previous negative test.

The date of the infection responsible for the reaction may have been previous to the date of the last negative test; but it is more probable that in many of the cases infection had occurred since the last negative test and caused a reaction to tuberculin persisting in the skin.

If the second interpretation is correct, the reaction serves as a valuable indicator of "primary infection."

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EFFECTS OF ACCIDENTAL EXPOSURE TO MUSTARD-GAS VAPOUR

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As a result of an accident a number of soldiers were recently exposed to an unknown dose of mustard-gas vapour in their sleeping-quarters. Exposure was for a period of half an hour or less about midday, and continuous from about 6 PM. In addition three men were exposed for a time in the forenoon. One of these, at 7 PM, complained of stinging eyes, a blocked discharging nose, and temporal headache, which prevented him from going to sleep. Three others noticed smarting eyes, dryness of the throat, or slight cough about 9 PM. Most of the rest went to sleep.

Between 11 PM and midnight—that is after 5–6 hours' continuous exposure—many men wakened with symptoms; gas was suspected, and all were ordered downstairs. They complained of painful watering eyes, with photophobia and dimness of vision; some could not open their eyes. They had moderate to severe headaches, mostly frontal, which lasted several hours or longer. They vomited, often repeatedly for an hour or two, and they were dizzy. Their throats felt dry, or in a few cases slightly sore, and some of them felt constriction in their chests; they coughed, but only to a slight extent.

The men were given temporary accommodation for the night. In the early morning castor oil drops were placed in their eyes. Later they were stripped, washed, and transported to hospitals. The observations here reported concern 12 of them admitted to one hospital. Another 13 milder cases were treated at another hospital.

SIGNS, SYMPTOMS AND CLINICAL COURSE

On admission about midday the men were tired and apathetic but not shocked. Their pulses were rather full and bounding, and their systolic blood-pressures slightly raised (116–142 mm. Hg), for the first day or two. Fever developed in half of them, with temperatures of 99°–100·6° F., not lasting longer than 3 days.

Skin.—Bright red erythema was present on faces and necks, the parts unprotected by clothing, sleeping-bags, or hair. In 3 cases it became more intense on the second day. However red, the skin was not itchy and not tender to pressure. Only in 1 case did vesicles appear—five tiny ones near one inner canthus. From the first or the second day the erythema quickly faded, disappearing in three to six days, leaving neither discoloration nor desquamation.

In 3 men fresh areas of erythema appeared on the fifth, sixth or seventh days in other places—the hands, the forearms, the antecubital fossæ, the axillæ, or the back of the upper chest. These areas were only moderately red; they itched or burned slightly, and in two days turned brownish, then faded, with slight desquamation.

Mouth, throat, larynx, trachea and bronchi.—On admission the men complained of dryness of mouth and throat, and in every case the soft palate, fauces and tonsils were intensely red and slightly swollen. These symptoms and signs subsided on the second and third days, but suddenly on the evening of the sixth day 10 of the 12 men developed burning pain in their throats, and distinct hoarseness, amounting in 2 cases to aphonia. These symptoms lasted, with diminishing intensity for, three to five days.

At the same time there was a little accentuation of the cough which was present in all the men from the time of admission and lasted into the second week. This cough was mostly nocturnal, and never severe, producing only scanty mucoid or mucopurulent sputum. Occasional rhonchi indicated minimal involvement of the bronchial tree in a few cases, but no other pulmonary signs developed, and radiological examination of the lungs in 4 of the severer cases on the second and the fourth days showed no abnormality.

Eyes.—On admission discomfort in the eyes varied from smarting or aching to severe pain. The lids were œdematous and red, and in some cases the men were unable to open them, on account of swelling but not of blepharospasm. Those who could open their eyes had photophobia and dimness of vision. The conjunctivæ were injected and the flow of tears profuse.

On the second day discomfort and lid-swelling were less, but chemosis was noted in 2 cases, one of which also showed triangular whitish conjunctival opacities on either side of each cornea. In 4 cases there were milky transverse bands on the corneæ, visible to the naked eye, lying opposite the interpalpebral fissures; most of the rest showed faint corneal haziness.

On the third day the characteristic opaque white triangles had appeared in the conjunctivæ of another case, but in general the signs in lids and conjunctivæ were subsiding, the corneæ remaining unchanged. This improvement continued, but was interrupted on the seventh day by a transient exacerbation of ocular discomfort (stinging, smarting, or watering) in 5 of the more severely affected cases. In all but 2 cases the eyes had returned to normal in 2 to 4 weeks. None developed purulent conjunctival discharge at any stage.

Examination of the cornea with a loupe (by Prof. W. J. B. Riddell) on the fifth day showed some superficial corneal œdema in 9 cases, with slight staining by fluorescein in 2.

Treatment.—On admission 3 drops of 2½% sulphacetamide ('Albucid') solution was placed in every conjunctival sac. This was repeated 2 and 4 hours later. It gave appreciable symptomatic relief. Thereafter for 4 days 2½% sulphacetamide ointment was applied between the lids twice daily and for 10 days the pupils were kept dilated with atropine. During the first 2 days swollen eyelids in close apposition were gently separated by a nurse every hour or two to facilitate the escape of tears. Sulphadiazine was given for 4 days to the cases showing rises of temperature, and sedatives administered for nocturnal cough.

All of the men, with the possible exception of 2, could have been regarded under active service conditions as fit for duty by the tenth day.

COMMENT AND SUMMARY

These cases were examples of mustard-gas injury due to prolonged exposure (6 to 8 hours) to a low concentration

of the vapour. They conform in general to the standard descriptions and were of slight to moderate severity. Among the clinical features, the following are worthy of note:—

1. Vomiting immediately and for some hours after exposure was repeated and severe, although cough was slight. It may be attributable to swallowed mustard vapour.

2. In the milder cases the initial erythema of skin and fauces, the pain in the eyes, the eyelid swelling and the conjunctival injection were maximal within 24 hours of exposure and thereafter declined. In the severer cases the skin erythema and the conjunctival changes (including chemosis and opaque white triangles) increased to a maximum on the second or the third days, and then declined.

3. Certain delayed effects appeared between the fifth and the seventh days—viz., erythema on areas of skin not previously reddened, sore throat and hoarseness or aphonia, and accentuation of cough and of smarting or watering of the eyes.

4. No secondary infection developed in conjunctivæ or lungs.

RETROGRADE AMNESIA

SOME EXPERIMENTS

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THE duration of amnesia *after* head injury has acquired practical importance as an index of the severity of the cerebral trauma (Symonds 1928), but retrograde amnesia (i.e., loss of memory for events preceding the accident) also remains an important clinical signpost. To the physician who finds the patient conscious, it is the first indication that the brain has been organically affected. Theoretically, too, there is interest in the paradoxical disappearance of material perceived at a time when the patient's faculties of observation and retention were still intact. It has long been known that retrograde amnesia follows not only trauma but many other forms of organic interference with cerebral function, such as suicidal attempts by hanging or gassing, and epileptic fits.

The general use of epileptiform convulsions for therapeutic purposes in psychoses provides a welcome opportunity of studying the phenomenon, making it possible to observe the psychological after-effects of an artificially produced cerebral disturbance, repeated several times in the same subject, and therefore to approach experimentally a problem which cannot be studied in animals.

Experiments of the kind to be described have been possible only since Meduna's original method of inducing the fit with an analeptic drug has been replaced by applying a short electric stimulus (Cerletti and Bini 1938). The preconvulsive period of anxiety and terror has thus been abolished, and objection and resistance of the patient to the treatment have become rare. All he remembers is that he has been put to sleep. Immediately after the convulsion he is confused and clouded for about half an hour and sometimes restless. This stage is followed in most cases by a short deep sleep. The further sequelæ vary a great deal. Some patients remain slightly drowsy and tired for as long as half a day, some only complain of headache; others are apparently well and resume their usual activities. Similarly the post-convulsive amnesia varies considerably.

METHOD AND SUBJECTS

Among the psychotic patients treated some selection was necessary in order to avoid those whose underlying psychosis might have interfered with the results of the memory test. All patients with impaired memory retention due to the underlying illness or to previous convulsion treatment were excluded, and all those whose full coöperation was doubtful. Most of those selected were depressives at a stage of beginning recovery, the rest schizophrenics and paraphrenics without acute symptoms interfering with retention.

Testing was restricted to the last minute before the electric current was applied. Four pictures of postcard size, coloured or black and white, easily recognisable and describable, were shown to the patient after all preparations for the treatment were completed, the patient lying on the couch with his headband fixed. Each picture was displayed for 15 seconds while the patient was told he should try to remember them. After 24 hours or less, but always in a condition of apparent recovery from the direct effects of the treatment, the subject was asked if he remembered any pictures and what they were. This test of "recall" was followed by a "recognition" test: he was asked to select the pictures he recognised from a series of 8–12 pictures among which the original ones were mixed. After some preliminary trials this standard procedure was found preferable to the display of a variety of visual and auditory material as used by Flescher (1941); moreover he extended the duration of testing to 5 minutes before the fit, which makes his results hardly comparable with those of the present study.

The simplicity of our test made remembering so easy that if an amnesia was found, its existence seemed beyond doubt; and on the other hand the time allowed before the convulsion was so short that we could count on detecting even the briefest retrograde amnesia. On the whole the patients liked looking at the pleasing pictures which distracted their attention from the alarming atmosphere of medical appliances and surrounding nurses.

RESULTS

Findings are based on 102 tests carried out in 46 patients. Recall of all 4 pictures was found complete only in 4 experiments performed by 2 patients. All others had forgotten some or all pictures when asked to recall them. Recognition was complete in 29 out of 102 tests which shows that retrograde amnesia is not a universal symptom after epileptiform convulsions. In a high proportion, however, some of the memorised material had been forgotten. If this indicates retrograde amnesia, more of the pictures shown first should be remembered than of those shown last. If the amnesia is patchy or uniform the first and the last shown pictures should be recalled or recognised in an equal number of experiments.

TABLE I—ANALYSIS OF PICTURES RECALLED AND RECOGNISED IN 102 TESTS OF 46 PATIENTS

Numbers	Picture 1	2	3	4
Recalled	43	41	30	22
Recognised	73	74	66	57

The figures of recollected pictures, as given in table I, show a progressive decline towards the last picture both for recall and recognition. The difference between the number of remembered first pictures and that of remembered last ones is 21 for recall; this is four times the standard error of simple sampling which is 5. The difference in recognition is 16—3·5 times the standard error (4·6). The differences are therefore statistically significant; the amnesia is of the retrograde type. It may be added than when I asked the patients who recognised the whole series (29 experiments) to reproduce the order in which the pictures were given, it was regularly the third and fourth pictures about which they were uncertain or mistaken.

Another result illustrated in table I is the greater number of pictures recognised than of pictures recalled. On the average, in the recognition test the amount of remembered material was double that in the recall test.

TABLE II—ANALYSIS OF PICTURES REMEMBERED IN 43 TESTS AFTER 3–8 HOURS AND IN 59 TESTS AFTER 24 HOURS

Numbers		Picture 1	2	3	4
Recalled	after 3–8 hrs.	23 (53)	20 (46)	12 (28)	8 (18)
	after 24 hrs.	20 (34)	21 (35)	18 (30)	14 (24)
Recognised	after 3–8 hrs.	37 (86)	37 (86)	32 (74)	25 (58)
	after 24 hrs.	36 (61)	37 (63)	34 (57)	32 (54)

The figures in parentheses are percentages.

To assess the influence of the time of testing on the extent of retrograde amnesia the experiments were divided into two groups. Of 102 tests, 43 were carried out 3–8 hours after the fit, and 59 after 24 hours had

elapsed (table II). If one takes the difference between the first and last picture as a measurement, retrograde amnesia certainly seems much commoner if tested for earlier; recollection seems 3 to 5 times better after 3–8 hours than after 24 hours. On closer scrutiny, however, one realises that this difference is to a large extent due to better recollection of the first picture after a shorter interval and that the difference between the number of remembered last pictures is insignificant. All one can say from our experiments is that the first pictures are definitely better remembered a few hours after the fit than after 24 hours and that the last picture does not share this advantage. However this may be interpreted, the figures show that it is not a matter of indifference at which time the patient is tested for retrograde amnesia.

DISCUSSION

From the results of these experiments the existence of retrograde amnesia as a primary symptom after epileptiform convulsions seems established. The fact that it was present in circumstances incomparably more favourable to remembering than those of an accident leading to a head injury removes a number of theories of retrograde amnesia from discussion. Thus the theory that the events preceding many accidents are forgotten because of their routine and casual character, can be discarded since retrograde amnesia was found for memorised material. Then the length of the memory gap *following* the accident cannot be held responsible; this gap never lasted more than a few hours in our experiments. The idea that circumstances of an accident are suppressed from memory because of their unpleasantness, or because of guilt feelings, the symptom being explained as secondary to emotional factors, is not supported by our findings. Even if some of the displayed pictures were remembered or forgotten because of likes or dislikes of the patients, such predilections would have been balanced in so large a series of subjects and of experiments. Special care was taken to change the pictures often and to vary the order of display.

The current view prevailing among neurologists and psychiatrists is that the cerebral injury destroys the traces or "engrams" of the immediately preceding impressions. Apart from the difficulty of accounting for a selective blotting-out by a disturbance affecting the whole of the cerebral cortex, the difference found between the tests of recall and recognition in our experiments is strongly against such a theory. The recall test closely resembles the questioning of the patient by the examining physician after an accident. Its results, as the figures show, could be greatly improved on in the recognition test. Similarly, Klein and Kral (1933–34) were able to reduce the retrograde amnesia after accident in one of their patients by reconstructing the situation before the accident. Such improvement would be impossible were the traces destroyed by the cerebral injury.

In other words, the apparently lost memory material obeys the normal rules of reproduction according to which recognition is always easier to recall. To arrive at a more satisfactory theory it seems appropriate to make use of a principle of normal psychology dealing with a similar phenomenon in memorising and learning—that of "retro-active inhibition" (Mueller and Pilzecker 1900). This depends on the well-known rule tested in numerous experimental studies that memorised material is better remembered if the learning of it is followed by an idle interval; and that mental or physical effort immediately after learning disturbs its recollection. In spite of its name (which has often been criticised) there is nothing to prove that retro-active inhibition acts backwards. One of the most favoured explanations of the principle is that learning is followed by a period of gradually diminishing activity of neural processes which intensify the associations established in the learning. If this "after-discharge" of neural elements consolidating the memory pattern (Britt) is interfered with by an interpolated activity, the memorised material is not so well remembered. The application of this well-established mechanism and of its explanation to retrograde amnesia is obvious: the cerebral injury prevents the latest memory traces, which are still in the process of consolidation, from being properly formed and organised. Thus retrograde amnesia can be regarded as an extreme case of retro-active inhibition.

As an explanation of retrograde amnesia the idea is not new. In 1875 Hamilton interpreted it as follows: "In order that a recollection may organise and fix itself, a certain time is necessary which in consequence of the cerebral excitement does not suffice" (Hack Duke 1892). That the theory corresponds to teachings of modern psychology should make it more acceptable.

It seems, however, difficult to suppose that consolidation of memories should be a process lasting over days or weeks, and therefore, according to this theory, retrograde amnesia should be short. In fact, its brevity in our experiments is striking. In only 10 instances out of 102 did it extend over one minute. Investigators of large numbers of patients with head injuries have pointed out that retrograde amnesia for days or weeks is extremely rare. Russell (1932) found a duration of more than 24 hours in only 4 out of 180 cases, and in most of his patients it lasted a few seconds or minutes only; among another series of 500 head injuries he found only one with a permanent retrograde amnesia extending backwards over one week.

The qualification "permanent" turns on the observation that retrograde amnesia after cerebral injury often shrinks with the time elapsing after the accident. Comparison of test results after 3–8 hours with those after 24 hours (table II) is suggestive of a shrinkage, but does not clearly prove it. Perhaps 24 hours is still too early for testing the "permanent" retrograde amnesia and a later test would have revealed a diminishing amnesia. It may be that retrograde amnesia after induced convulsions is generally too short to give clearer insight into this point. On the other hand, the difference in the results of the two groups of tests, especially in remembering the first picture, shows that retrograde amnesia is undergoing some change during the first day after the trauma; this change is probably not one of the memorised material, but of the ability to reproduce it. Cerebral efficiency in general is definitely impaired immediately after the convulsion, as is shown by confusion and cloudiness lasting an hour or more. It seems not to be completely restored at a time when clinically the patient is apparently recovered.

In patients with head injuries there is a parallel to the fuller recollection of the first picture in the early test: patients occasionally reproduce, in post-traumatic drowsiness, details of the accident which they have forgotten when they regain consciousness. This event, illustrated in Russell's cases, can have medicolegal consequences; and it defies all theoretical explanations.

Among the questions left unanswered by the present investigation is that of the individual differences between our subjects' retrograde amnesia. Many were tested several times, each seemed to keep to his own type of remembering or forgetting the picture series. As mentioned before 2 had remembered everything and in 6 patients (10 experiments) the amnesia was longer than one minute. Others recalled little, but recognised all pictures; in others, again, recall and recognition were rather similar in distribution; and so on. Individual differences in patients with head injuries are easily explained by the different severity of the cerebral damage and by its localisation. The electrically induced epileptic seizure, however, seems to vary so little in its clinical symptoms and in its duration from case to case, that one is forced to surmise an unknown personal factor influencing the extent of retrograde amnesia—a factor which may play its part in post-contusional cases as well.

SUMMARY

In patients experiencing electrically induced convulsions retrograde amnesia was found for material memorised during the last minute before the fit.

Patients more often showed retrograde amnesia for the recall of material than for its recognition.

In only one-tenth of the experiments was retrograde amnesia longer than one minute.

The time-interval between fit and test influenced the results of testing. Shrinking of retrograde amnesia, though suggested by the difference in findings, could not be plainly demonstrated.

In contrast to the idea that retrograde amnesia is caused by the destruction of memory traces, the theory

is proposed that the cerebral injury interrupts the consolidation of recent memories. This is analogous to the phenomenon of retro-active inhibition in normal psychology.

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RESECTION OF SMALL INTESTINE IN AN INFANT THREE WEEKS OLD

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INGUINAL hernia is common in small children, and in 5–7% of cases is irreducible (Hogg 1942). Strangulation, however, is unusual: of 1740 cases of inguinal hernia recorded by Thorndike and Fergusson (1938), 106 (6 %) were irreducible, but only 5 required resection of the intestine; and among the 1000 cases of Herzfeld (1938), only one, a baby 12 days old, needed resection. At the Hospital for Sick Children, Great Ormond Street, since the beginning of 1938 468 cases of inguinal hernia have been operated on: 6 were irreducible (1·3%) and in only 2 of these was intestinal resection necessary.

It is a common belief that gut resection in infancy has a mortality-rate of 100% (Gordon 1940). Of the cases treated at Great Ormond Street, the first to require resection of small intestine died on the 14th day with numerous intraperitoneal abscesses, apparently secondary to leakage from the anastomosis. The second, however, recovered.

The child was a firstborn full-term male delivered on Nov. 7, 1942, after a normal labour; his birth-weight was 6 lb. 5 oz. and he was breast-fed. On Nov. 25 he began to vomit and ceased to pass motions. Two days later the mother noticed a lump in his right groin and he was admitted to hospital.

By that time he was ill, pale and dehydrated, and was crying continuously. The abdomen was distended and tense and the umbilicus prominent. From the right groin a large firm, tender, red and œdematous mass extended down into the scrotum. The penis and the left side of the scrotum were grossly œdematous. There was fæcal vomiting with constipation.

Just before operation 3½ hours after admission a stomach-tube was passed to empty the stomach. After its removal, anæsthesia was induced with ethyl chloride and open ether (preceded by atropine, gr. 1/200). An oblique incision in the right groin exposed the sac of a large indirect inguinal hernia containing a strangulated loop of small intestine, 3 in. of which was gangrenous. After dividing the constricting band at the neck of the sac, the gangrenous portion with adjacent healthy bowel (4 in. in all) was resected. The ends of the proximal and distal segments of the intestine were then ligatured, the stumps being invaginated with a catgut purse-string suture on an atraumatic intestinal needle. A side-to-side anastomosis was next performed; no intestinal clamps were used, the loops of the intestine being held by the assistant's fingers; 6/0 catgut on an atraumatic intestinal needle was employed. The anastomosis was performed in the usual way so that there were two layers of sutures. A sucker was used for removing the contents of the gut which tended to escape. The length of the anastomosis was ¾ in. Omentum was not wrapped round the suture line and sulphanilamide powder was not applied.

While the anastomosis was being formed the child vomited and stopped breathing. A stomach-tube was passed and the stomach again emptied; oxygen and nikethamide ('Coramine') were administered and he revived. When the intestines had been replaced in the peritoneal cavity, the peritoneum was closed with a single purse-string catgut suture to hold back the abdominal viscera. No attempt was made to repair the hernia. The skin was sutured with interrupted sutures and a firm pad was fixed tightly over the right groin.

After operation the child was given nothing by mouth, but received glucose-saline by intravenous drip at the rate of ¾ oz. per hour. When fæcal vomiting began again at midday next day (Nov. 28) an ordinary stomach-tube was passed and attached to a continuous-suction apparatus, working at a negative pressure of 1½ in. Hg. Much fæcal material was obtained through this tube. A normal stool was passed 44 hours after operation, and 4 hours later feeding by mouth was commenced, starting with 1 drachm of glucose-water hourly and increasing by a drachm every 4 hours. The suction was stopped for half an hour after each feed and then restarted: it was finally discontinued 54 hours after operation. Intravenous infusion was continued for 2½ days. Breast-milk feeds were slowly introduced and on the 7th day the child was back on the breast and taking his feeds well. Apart from some suppuration in the wound and a boil on the buttock recovery was thereafter uneventful.

Four factors may have helped this baby to survive. (1) Great care was taken over the anastomosis, but otherwise the operation was performed as quickly and as simply as possible: there was no attempt at a repair. (2) By holding the bowel in fingers instead of clamps, a minimum of trauma was inflicted on the bowel. (3) All feeding by mouth was stopped for 2 days after the operation, the fluid intake being maintained by continuous intravenous infusion of glucose-saline. (4) The proximal part of the alimentary tract was kept empty by continuous suction through a stomach-tube for 2 days.

My thanks are due to Mr. Graham Humby for permission to publish this case.

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PERFORATION OF RECTUM FROM IMMERSION BLAST

P. G. C. MARTIN, MB CAMB, FRCSE
SURGEON LIEUT.-COMMANDER, RNVR; SURGEON, CHELMSFORD AND ESSEX HOSPITAL

IN March, 1941, when a cruiser was torpedoed in the Mediterranean, an ordinary seaman, aged 28, was thrown into the water. Destroyers were dropping depth charges in the neighbourhood, and one exploded near him; how near he did not know—he remembered being winded, but little else. He was picked up, and 14 hours after the torpedoing of the cruiser was admitted to a hospital ashore.

On admission to hospital the patient showed no external signs of wounding or bruising. He was complaining of severe lower abdominal pain, worst in the right iliac fossa. He was also passing a small amount of bright red blood from the anus. His general condition was none too good; temperature 100° F. and pulse-rate 120 per min. He had not vomited. The abdomen was rigid all over, more especially in the right iliac fossa. There was no distension. On auscultation of the abdomen there was complete silence. A rectal examination was not done, as it was thought further damage might be done to the injured part.

After a preliminary infusion of saline and glucose, a laparotomy was performed under oxygen and ether anæsthesia. A left paramedian incision was made and pus was seen in the peritoneal cavity. The first part of the rectum on its anterior surface showed a lacerated bruised perforation about 1 cm. in diameter. The rest of the rectum appeared healthy and normal. The perforation was oversewn and buried with a purse-string suture. The abdominal contents were rapidly searched for any further injuries, but none was found. A pelvic colostomy with a long spur was made. The pelvis was drained and the abdomen closed. A transfusion of 2 pints of blood was given. His condition was poor at the end of the operation.

Next day there was well-marked jaundice and his condition deteriorated. On the third day paralytic ileus became evident, distension and vomiting started, and his pulse-rate rose to 140 per min. Duodenal drainage, intravenous drip salines and small repeated doses of morphine were of no avail, and he died 52 hours after operation.

At autopsy general peritonitis was found, originating in the pelvis, with paralytic ileus involving the whole small bowel.

There was an enlarged septic spleen. The right lung showed a contusion on the anterior surface near the medial and inferior margins; hypostatic congestion was present at both bases. No evidence of internal hæmorrhage was found. The heart, kidneys and liver appeared normal macroscopically. Evidence of a rupture some ½ in. in length in the rectum was found; this had been stitched together and was in the process of healing.

Here is a case of blast abdomen causing intraperitoneal perforation of the first part of the rectum, due, as Williams [1] has very reasonably conjectured, to a pressure wave travelling in a fluid medium meeting a gas-containing organ. Williams in his experiments showed that the commonest effects of blast injury to the abdominal contents were subperitoneal and submucosal effusions of blood. This case showed no subperitoneal hæmatomata, but unfortunately the mucosa of the alimentary tract was not examined post mortem.

Several cases have now been described where, after immersion blast injury, severe abdominal pain and melæna have been present, and recovery has taken place without operative interference. In these cases, presumably, the pathology was that described by Williams. However, resolution does not necessarily occur, and the condition may progress to necrosis and secondary perforation.

This case is of interest in that perforation of the rectum was a primary event in a single organ, with no evidence of other abdominal injury.

Reviews of Books

Cunningham's Text-book of Anatomy

(8th ed.) Editors: J. C. BRASH, MD BIRM., FRCSE; E. B. JAMIESON, MD EDIN. (Oxford University Press. Pp. 1558. 60*s*.)

THIS book has developed steadily as a reliable guide to the student, and a few criticisms may therefore be offered in a helpful spirit. The section on craniometry is not of great use to the medical student, but in any case it would be well to omit Huxley's obsolete classification of skulls into cryptozygous and phænozygous, since under which of these two any skull falls depends entirely on the distance from which it is viewed. The section devoted to the morphology of the limb bones contains one or two debatable statements, and in the section of myology the remark that "When the teeth are tightly clenched, the hyoid bone will be found firmly fixed" seems to be invalidated by the fact that swallowing can be performed with the teeth clenched. In one of the new figures the mucous glands of the palate are depicted well forward on the hard palate and lying along the middle line; the text, however, correctly states that these glands are situated "in the posterior half of the hard palate, except near the raphe." Another attractive new illustration (fig. 374), which might lead one to suppose it had been drawn from an actual specimen, shows the membranous layer of the superficial fascia of the abdominal wall joining with the deep fascia of the thigh along the line of the inguinal ligament. In the text it is described as joining "just distal" to the ligament. In Cunningham's *Manual of Practical Anatomy* the line of fusion is described correctly. Correlation between the *Manual* and the *Textbook* again fails in the account of the descent of the testis; the student who, it is to be hoped, has encountered the correct figures in the *Manual*, will be disconcerted to meet incorrect ones in the *Textbook*. Attention is drawn to these little oversights only because "Cunningham" has grown so trustworthy in general. It has also grown in size and in cost, weighing nearly six pounds and costing three.

Essentials of Gynecology

WILLARD R. COOKE, MD, FACS, professor of obstetrics and gynecology, University of Texas. (Lippincott. Pp. 474. 42*s*.)

Professor Cooke has concentrated on pathology in the conviction that in gynæcology intelligent judgment is impossible without a working knowledge of it. The text is illustrated by photographs; those showing macroscopic appearance are good, and so are most of the photomicrographs, but a few are poor and deserve to be replaced in future editions. An unusual but valuable chapter is devoted to the patient herself, her mode of life and psychology. Another long chapter deals with functional disturbances. Stating that 95% of human suffering is mental, Dr. Cooke rightly observes that the removal of a bleeding fibromyoma may actually make the patient subjectively worse if she is left to welter in fear and apprehension as to the end-results of the operation. The chapter on operative gynæcology is not intended to serve the needs of the surgical specialist but to provide the practitioner with a working knowledge of preoperative and postoperative care. In contradistinction to the care and attention directed to the subjects mentioned above, the treatment of the so-called "minor" ailments by the patient's own doctor deserves more detailed attention than it receives. In the section on the treatment of dysmenorrhœa presacral sympathectomy claims almost as much space as all other methods of therapy combined. With these few exceptions this is a sound work and it has been beautifully produced.

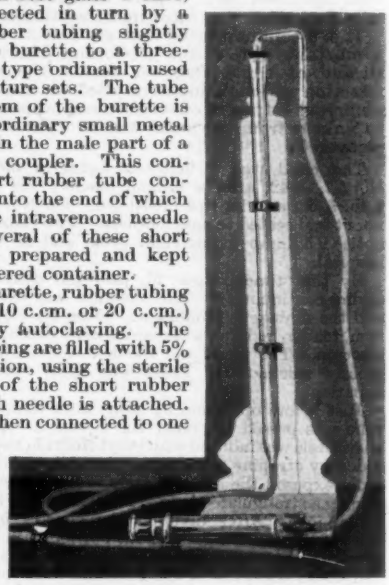
1. Williams, E. R. P. *Brit. J. Surg.* 1942, **30**, 38.

New Inventions

APPARATUS FOR ADMINISTRATION OF SMALL DOSES OF PENTOTHAL

MANY anæsthetists now use 'Pentothal Sodium' for the induction of general anæsthesia. This procedure is sometimes difficult under war conditions because of the demand it makes on the available syringes. With the apparatus here described small induction doses of 5% pentothal solution can be given to four or five patients with one sterile syringe.

The apparatus illustrated in the figure consists essentially of a plain glass burette connected to a piece of small-bore rubber tubing about 18 in. long. The burette is corked with a rubber stopper, through which passes one arm of a small-bore glass U-tube, which is connected in turn by a length of rubber tubing slightly longer than the burette to a three-way tap of the type ordinarily used in lumbar-puncture sets. The tube from the bottom of the burette is fitted with an ordinary small metal tap, and ends in the male part of a male to female coupler. This connects to a short rubber tube connector (4 in.), into the end of which the butt of the intravenous needle is forced. Several of these short connectors are prepared and kept sterile in a covered container.



For use the burette, rubber tubing and a syringe (10 c.cm. or 20 c.cm.) are sterilised by autoclaving. The burette and tubing are filled with 5% pentothal solution, using the sterile syringe. One of the short rubber connectors with needle is attached. The syringe is then connected to one of the open arms of the three-way tap. The tap is turned, so that when the plunger of the syringe is withdrawn air is drawn in through the other side arm into the syringe. The tap is then turned so that the syringe makes connexion with the rubber tubing leading to the top of the burette. The needle is inserted into the patient's vein and the tap in the delivery tube is opened. Air is injected into the top of the burette by advancing the plunger of the syringe, and displaces an equal volume of pentothal, which is delivered into the vein. The required amount of pentothal having been delivered, the tap in the delivery tube is closed and the needle withdrawn. The short connector is removed and discarded. The free end of the delivery tube is wrapped in a sterile gauze swab wet with alcohol and placed in a sterile test-tube. The syringe is left in place. For subsequent patients a fresh sterile needle and short connector is attached.

R. A. GORDON, MD TORONTO, DA
Major, RCAMC

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THE LANCET

LONDON: SATURDAY, NOVEMBER 13, 1943

NO RECOVERY NO GRANT

Mr. BEVIN's dramatic announcement early in the year that those who drop out of employment as a result of tuberculous infection are to have precisely the same chance of getting back into it as those who have suffered wounds or accidents seemed too good to be true. In one respect it was, for the MINISTER OF HEALTH has ruled that the Exchequer grant is to enable persons to give up work temporarily "for treatment which is in the interest of the public health no less than their own." Only those are eligible whose recovery is sufficiently sure to make them a realisable asset to the man-power of the nation in war-time. On the tuberculosis officer falls the invidious task of drawing the line. If he says "no recovery" the Exchequer says "no grant": and the patient loses both the money and the incentive to get well. It is true that in any case he may receive money through the local authority which can, and ultimately indeed must, provide assistance when the Exchequer refuses it; indeed in some places it seems that such assistance is not far short of the grant. But it is not just a question of accounting; the press has been full for weeks of the bitterness (reflected in our Parliamentary column this week) which is being aroused by the distinction between recoverable and irrecoverable disease. The line is impossible to draw with any accuracy. It had to be drawn for sanatorium benefit in the unhappy period before the Public Health Act of 1921 swept it away. Tuberculosis officers are not infallible and there are borderland cases in which the encouragement of a grant might well turn the scale towards recovery. There is a feeling too that the MINISTER himself regretted the reservation, as it was not mentioned in his explanatory leaflet to the public; moreover the premature discharge of the grantless from hospital or sanatorium must be contrary to the public health, on which he lays such stress. Do not the invidiousness and the unhappiness and the increased risk of infection outweigh any small saving of public money? Unless the scheme is made comprehensive, in accordance with its first intention, shall we not drift into the position that the state only helps the sick civilian in proportion to his capacity to return the help in services rendered? On the field of battle we do not give priority treatment to the casualties who are expected to fight again.

DRUGS AND THE EEG

THE electro-encephalogram is an excellent, and possibly the best, physiological gauge of depression of the highest cerebral functions. Impairment of consciousness or increased attention is reflected in a shift of energy distribution towards the slow or fast end of the cortical frequency spectrum. Drugs which affect consciousness modify the EEG, so that the EEG gives us an objective method of studying one aspect of drug action, but the modifications are difficult to describe without the assistance of automatic frequency analysers. The human visual apparatus is an integrating mechanism, not an analyser; events tend to be perceived as a whole, and the minor changes in potential distribution which most drugs produce are readily overlooked. But the advent of apparatus for automatic frequency analysis in America,[1] and now in England,[2] has made the accurate assessment of changes in cortical frequency reasonably easy, and drug action on the EEG is now being studied in detail.

Working with a Grass frequency analyser, GIBBS and MALTBY [3] found, as was expected, that the drugs known clinically as depressants or stimulants can be sorted into the same two groups by the EEG changes they produce. Thus morphine, 'Pentothal' and phenobarbitone redistribute energy towards the slow end of the spectrum, whereas caffeine, amphetamine ('Benzedrine') and adrenaline cause a shift towards the fast end. In their effects on the EEG, therefore, the depressant drugs are comparable to normal sleep and the stimulants to attention. Of the drugs studied, pentothal, which produced the greatest clinical depression, caused the greatest shift towards the slow end of the spectrum, and adrenaline produced both the greatest clinical stimulation and the greatest shift towards the fast end, amphetamine coming next and caffeine third. In this way the activity of drugs with a similar action can readily be compared.

In cases of petit mal, WILLIAMS and RUSSELL [4] have studied in the EEG the effect of anticholinesterases on epileptic activity. In small doses eserine tended to prevent attacks, while in larger ones it increased their frequency and duration. 'Prostigmin,' on the other hand, invariably increased epileptic activity as seen in the EEG, and reversed the effect of small doses of eserine. WILLIAMS [5] used the same technique to investigate the effect of other substances known to modify transmission at cholinergic endings. Intravenous injection of acetylcholine was followed by an increase of epileptic activity, and this effect was abolished by atropine. Since eserine, prostigmin, carbaminoylcholine chloride and acetycholine have a similar action on cerebral rhythms in epileptics which is abolished by atropine, it seems likely that this action is related to an alteration in the acetylcholine-transmitting mechanism in the body; but WILLIAMS points out that the effect may be an indirect one, due to peripheral changes, since the effects of choline-like substances are so widespread and complex. CHATFIELD and DEMPSEY [6] applied acetylcholine and prostigmin locally to the cortex of cats. They found that acetylcholine alone produced no change in the cortical rhythms and prostigmin a transient depression of spontaneous activity at the area of application. When prostigmin was followed by acetylcholine a characteristic series of changes occurred. There was first an increase of spontaneous activity, then an increase of low-voltage 20–30 cycle rhythms which spread over the whole cortex while the amount of 5–10 cycle rhythms decreased. The effect of a single peripheral stimulus on this preparation was to

1. Grass, A. M. and Gibbs, F. A. *J. Neurophysiol.* 1938, **1**, 521.
2. Walter, W. G. *Electronic Engineering*, June, 1943.
3. Gibbs, F. A. and Maltby, G. L. *J. Pharmacol.* 1943, **78**, 1.
4. Williams, D. J. and Russell, W. R. *Lancet*, 1941, **i**, 476.
5. Williams, D. J. *J. Neurol. Psychiat.* 1941, **1**, 32.
6. Chatfield, P. O. and Dempsey, E. W. *Amer. J. Physiol.* 1942, **135**, 633.

leave the cortical response unchanged, but when repeated stimuli were given the cortical response was increased. All these effects, except the low-voltage fast activity, were abolished by section of the thalamic radiations, and from this CHATFIELD and DEMPSEY argue, first, that low-voltage fast activity is intrinsic to the cortex itself, not requiring thalamic circuits, and secondly, that since activity associated with spontaneous bursts and continuous 5–10 cycle rhythms is abolished by removal of the thalamus, such effects represent activity of thalamo-cortical circuits. However this may be, it is evident that the application of EEG technique to the study of the action of drugs on the central nervous system may well advance our knowledge, not only in pharmacology but also in neurophysiology and clinical medicine.

HÆMOLYTIC FACTORS

IT is not difficult to show that excessive hæmolysis, or destruction of red blood-cells in vivo, is the characteristic feature of an anæmia. But when we have diagnosed "hæmolytic anæmia" we have not got much further; in order to treat that anæmia, the reasons for the hæmolysis must be known. The antibody reactions connected with the Rh factor of LANDSTEINER and WIENER have been proved responsible for some at least of the hæmolytic anæmias of infancy; but, apart from certain known hæmolytic poisons, this is so far the only hæmolytic group about which we have certain information. When spherocytes were demonstrated in the blood of patients with familial acholuric jaundice, it was suggested that these cells were being produced by a disordered bone-marrow and were abnormally fragile, the fragility being measured by testing with hypotonic saline solutions. Further research, however, has shown that spherocytes can be produced by artificially induced hæmolysins, and they have been found in other conditions. DAMESHEK and SCHWARZ,[1] using such artificial hæmolysins, reproduced a whole series of hæmolytic anæmias corresponding to most of the known syndromes, but it has nearly always been impossible to demonstrate any circulating hæmolysin in human hæmolytic diseases.

This fragility of the red blood-cells has been elaborately studied, not only with hypotonic saline but also with a substance known as "lysolecithin" which is thought especially to affect red cells held in the spleen. Estimation of "lysolecithin fragility" is difficult but has been done because in some hæmolytic conditions the red cells show an increased lysolecithin fragility but a normal fragility in saline. One of these conditions is blackwater fever, which has been extensively studied because of its severity and its danger to life and because it is a pattern of hæmolytic disease. FOY and KONDI,[2] like others before them, report that the lysolecithin fragility is undoubtedly increased in this disease, but they can make little use of the information; they cannot accept the thesis that blackwater fever is due to some effect of the malarial parasites on the erythropoietic tissues of the victim, since they showed before[3] that normal red cells transfused into blackwater fever patients are destroyed in exactly the same way as the patient's cells, so that no fundamental defect in the red cell can be assumed. They also found that though lysolecithin has a hæmolytic action in vitro, no such action can be demonstrated in vivo.

It cannot honestly be said that these often difficult and elaborate studies of red-cell fragility have helped to explain the mechanism of hæmolysis, although we have learnt a lot from them about the properties of the red cell itself. Is it possible that we are asking the wrong questions and so receiving, in Nature's off-hand way, no sensible answers? MAEGRAITH, FINDLAY and MARTIN[4] have started a new approach to the problem of blackwater fever hæmolysis that may prove more fruitful. They have shown that slices of human tissues contain a factor that will lyse saline suspensions of red blood-cells; human serum, on the other hand, contains a factor that inhibits this lysis, and in blackwater fever they found that the inhibitory power of the serum is much reduced. They therefore suggest that there is no abnormal lysin in the blood of blackwater fever patients, "the lysis is simply a manifestation of excessive uninhibited activity of a normal lytic process." These findings await confirmation but sound promising; material for study is, unfortunately, easy to come by.

NO PLACE LIKE HOME, BUT . . .

THE return of the repatriated prisoners from Germany offers the War Office and the Ministries of Labour and Pensions an opportunity for a large-scale experiment in social rehabilitation before they are called upon to meet the more massive problems which will follow the end of the war in Europe. The training of the physically handicapped man, so that he can take his place in the industrial world, is familiar work to the Ministry of Pensions. But the mental state of the repatriated prisoner is a more subtle matter. There will of course be the gross casualties—the man who returns to find his family has perished in the blitz or has disintegrated for other reasons; but such cases will be few. In the prison camp, every prisoner will have built up a mental picture of home, and this fantasy may bear little relation to the real thing. After highly emotional episodes, life for all of us is apt to seem dull and flat. For the repatriated prisoner, this anticlimax will coincide with a realisation that home is not without its drawbacks and irritations. It would not be unreasonable to predict the development of something in the nature of a reactive depression, which will call for careful handling. After a brief holiday, a return to kindly but firm discipline might not come amiss, coupled with a steady increase in physical work. Interest in current affairs might be reawakened at the same time by lectures and discussion groups. Some may feel, however, that the man has a better chance of working out his own salvation in the cold hard world. We have a chance to try out both methods. If two groups of repatriated prisoners could be treated along these lines, with adequate psychiatric observation of both groups, they might well provide the necessary data for planning the mental rehabilitation of the other prisoners of war.

1. Dameshek, W. and Schwarz, S. O. *Medicine* (Baltimore), May, 1940, p. 231.
2. Foy, H. and Kondi, A. *Trans. R. Soc. trop. Med. Hyg.* 1943, **37**, 1.
3. See *Lancet*, 1941, ii, 530.
4. Maegraith, B. H., Findlay, G. M. and Martin, N. H. *Ibid*, 1943, i, 573.

THE next session of the General Medical Council will open on Tuesday, Nov. 23, at 10 AM

Prof. L. G. PARSONS will deliver the first Charles West lecture at the Royal College of Physicians of London next Tuesday, Nov. 16, at 2.15 PM. He will speak on the prevention of neonatal disease and neonatal death.

Annotations

AN ANTIBIOTIC FROM ASPERGILLUS

SINCE the discovery of penicillin by Fleming and its exploitation by Florey and his colleagues, systematic search has been made through large numbers of moulds and similar organisms for substances with antibacterial activity. In addition to gramicidin, which had been discovered earlier by Dubos, several compounds of different types have been brought to light, such as pyocyanin and notatin. The latest to be described comes from *Aspergillus fumigatus* mut. *helvola* Yuill. Antibacterial activity was reported from the culture filtrates of this fungus by Wilkins and Harris [1] and the active substance in a crystalline state has been isolated by Chain, Florey, Jennings and Williams [2] who give a detailed account of its chemical and biological properties. It seems to be a monobasic acid with the probable empirical formula $C_{32}H_{44}O_8$, and has been named helvolic acid; though soluble in most organic solvents it is insoluble in water, though its sodium salt is freely water-soluble. It is thermostable and stands boiling for 15 minutes. Helvolic acid is distinct from the substance isolated by Waksman and his colleagues [3] from *Aspergillus fumigatus* and named fumigacin. Its antibacterial action is directed mainly against gram-positive organisms and it has little action on gram-negative ones. Thus in concentrations of 1:100,000 to 1:1,000,000 it prevents the growth of staphylococcus, pneumococcus, *Strep. pyogenes*, *B. anthracis*, *C. diphtheriæ*, *Cl. welchii* and others, but it fails to check typhoid, dysentery or coliform bacilli, proteus or *Ps. pyocyanea*. The dilution at which it inhibits growth depends greatly on the size of the inoculum used, small numbers of bacteria being checked much more readily than large ones. Its action is predominantly bacteriostatic: it prevents multiplication but does not kill the germs. This effect is not inhibited by *p*-aminobenzoic acid, by pus, tissue extracts or peptones; so that it is clearly differentiated from the inhibition due to sulphonamides. Bacteria cultivated in the presence of subeffective concentrations rapidly become drug-resistant and are no longer susceptible to the action of the compound; but such helvolate-resistant organisms are still susceptible to penicillin. Helvolic acid is not unduly toxic to mice, the maximum tolerated dose of the sodium salt by intravenous injection being about 5 mg. per 20 g. body-weight; much larger doses are tolerated by mouth. Leucocytes are not affected by concentrations up to 1:1600, and tissue cultures tolerate concentrations of 1:2500 for 48 hours. Some of it may persist in the blood of mice for 6–10 hours after administration. It is slowly absorbed along the whole length of the gastrointestinal tract and there seems to be no destruction of it by bacteria in the lumen of the gut; it is gradually excreted in the urine and bile. In the tissues it becomes concentrated, chiefly in the liver, and only traces were found in the spleen; apparently it does not pass easily from the blood to the cerebrospinal fluid. When injected intravenously into a cat it had no significant influence on the cardiovascular or other systems; no symptoms were caused by moderate doses injected intracisternally into rabbits. Its chief toxic effect seems to be on the liver, large or repeated doses causing extreme vacuolation and finally destruction of hepatic cells. In face of so much chemical, bacteriological and pharmacological information it is disappointing to learn that its therapeutic action in vivo is small. Mice were infected with staphylococci or streptococci and an hour later treatment with helvolate was begun. The life of the mice was undoubtedly prolonged, but complete cures were few. These tests were performed on only a small number of animals, and it may be that a different dose-schedule might give better results. Yet even if helvolic acid itself proves to have little clinical value it belongs to a group of substances hitherto unexplored for antibacterial properties; and chemical modification of the molecule may yield compounds much more active and no more toxic.

1. Wilkins, W. H. and Harris, G. C. M. *Brit. J. exp. Path.* 1942, **23**, 166.
2. Chain, E., Florey, H. W., Jennings, M. A. and Williams, T. I. *Brit. J. exp. Path.* 1943, **24**, 108.
3. Waksman, S. A., Horning, E. S. and Spencer, E. L. *Science*, 1942, **96**, 202; *J. Bact.* 1943, **45**, 233.

SILICOSIS IN SWEDEN

SILICOSIS was added to the list of occupational diseases in Sweden in 1930. From 1934 onwards, Bruce [1] carried out surveys in various industries in which a risk of silicosis was suspected, and investigated silicotic workers clinically, assessing the disability at various stages of the disease. Altogether, 6500 workers in Sweden are estimated to be exposed to a silicosis risk, about half of these in mining, chiefly of iron ore. Iron and steel production and ceramics account for the bulk of the remainder. About 40% of all these workers were examined and X rays were taken of two-thirds of them. Bruce classifies the X rays according to the three stages defined by the 1930 international conference, but adds a fourth category of suspected silicosis, characterised by linear or reticular shadows. He pays particular attention to the incidence of tuberculosis and its relation to silicosis. The industries surveyed covered ceramics, iron and steel works, silicon-alloy manufacture, sandstone quarrying and grinding, quartz mining and milling, and mining. In several industries part of the survey was repeated after 3–5 years, or earlier results obtained by other investigations were utilised, in order to estimate the rate of progress of the lung changes. Of 2631 persons from various industries examined, 408 showed stage 1 of silicosis, 141 stage 2, and 76 stage 3. As would be expected, the hazard varies very much with the type of work. Thus stage 3 was first reached in under 5 years in quartz milling, after 10–15 years in cleaning castings (fettling), after 15–20 years in furnace repairing (iron and steel) and drilling iron ore, after 25–30 years in porcelain works, and after 35–40 years in foundry casting. After 20–25 years of work all the sandstone grinders, 60–70% of the porcelain workers, furnace repairers, fettlers and drillers in iron ore, but only 2% of the foundry casters had silicosis of one stage or another. The repeat survey led to the impression that, if it takes a long time to reach stage 1, there is in general little tendency towards further change, even if dusty work is continued; whereas if stage 1 is reached quickly further lung changes may occur even if the dust exposure ceases. Drilling iron ore seems to be an exception, for drillers contracted stage 1 comparatively rapidly but there was little progress towards further change; this may be due to the quartz in the dusts being diluted with much iron oxide. The X-ray appearances showed differences for the different occupational groups. Thus linear exaggerations (reticulation?) are well-marked in porcelain workers but absent in iron-ore drillers, whereas foundry casters and furnace repairers take an intermediate position. With porcelain and silicon-alloy workers, and in quartz milling, the nodules have irregular shapes and diffuse boundaries and are not very dense. With the other occupations examined, particularly in iron-ore drillers, the nodules are round, more clearly defined and denser. In advanced silicosis lateral X rays show the boundary between consolidated and emphysematous parts of the lungs to have a different position for different types of occupation. Bronchographic technique shows dislocations and changes in lumen of the bronchi. Routine clinical tests showed that the average age increased from stage 1 to stage 3. No tendency to adiposity but a slight reduction in thorax mobility was seen in stage 3. The clinical observations, apart from the X rays, were chiefly concerned with objective

1. Bruce, T. *Acta med. scand.* 1942, Suppl. 129.

measurements of the impairment of lung function during rest and work. For analysis of these clinical tests the three silicotic stages were subdivided into (*a*) those without subjective symptoms, (*b*) those with dyspnœa and partial disability, and (*c*) those with total disability. Extensive spirometric measurements during rest showed no significant differences for minute-ventilation or oxygen-ventilation equivalent, but stage 3, and particularly group 3*c*, showed a higher respiration frequency and reduced total capacity, due to a reduction of the complementary air, not of the functional residual air. Spontaneous hyperventilation led in many stage 3 cases to a rise of expiration level. When spirometric measurements were carried out during work (stair-climbing), respiratory insufficiency was only found during the heaviest type of work with stage 1; it increased with stage 2 and was very frequent even with the lightest type of work with stage 3. Other affections of the cardiopulmonary system in combination with silicosis usually caused greater insufficiency. Bruce's survey gives a good picture of the level and variation of hazard found in Sweden, while the clinical part of his book brings out the relation between lung function and anatomical change of the lungs. But he does not contribute to our knowledge of how and why the dust causes the lung changes.

THE UNSUITABLE SOLDIER

EVERYBODY agrees that men of neurotic disposition who are very likely to break down in the Services should be spotted and rejected at the outset. Few people however have the hardihood to say that we have any sure means of detecting nearly all such people at the outset, if they have not already had, or still exhibit, a neurotic illness. There is a big gap between contending that manifestly predisposed and unsuitable men should have been recognised as such, and asserting that all those who have subsequently broken down once were manifestly predisposed and unsuitable. The gap has been made narrower by the intelligent use of wisdom after the event, as in studies of the abnormal traits of personality which are discovered to have been commonly present in the men who subsequently broke down. Steinberg and Wittman[1] point out that such studies are of doubtful value until we know the frequency with which the same traits occur in people who do not break down. For this reason they examined three groups of soldiers—158 presumably healthy men attached to the Army Medical Corps, 22 soldiers in the psychiatric unit of a general hospital, and 87 patients in the Veterans unit at a mental hospital. The men in the second group were suffering almost entirely from neurotic illnesses, and those at the mental hospital had been, or were still, insane. The investigation was a thorough one, covering the customary material of a psychiatric history as well as special psychological tests aimed at the elucidation of the patient's personality. The Guilford personality scale was employed, and personality was accordingly assessed in terms of the five factors—social introversion, thinking introversion, depression, cycloid tendencies, and care-free disposition and impulsiveness. The control group differed strikingly from the other two. Whereas half the neurotics and psychotics were socially introverted and depressive or cyclothymic, among the controls one-third or less showed such features, and 84% of them were care-free and lively—a characteristic found only in about a quarter of the men with psychiatric illness. It was also found that the relationship of the men to their parents, especially to their mother, had been far more satisfactory among the control group, and that a history of social and sexual maladjustment in early home and school life had been prominent in the psychotic soldiers, though not in the neurotic or healthy ones. There was a striking difference in the average number of jobs and in the longest time any single job had been held; the maladjusted men had on the average held two or three times as many positions as the control group, and there was a similar proportion in the duration of individual jobs. Teetotallers were more numerous among the maladjusted; so were divorced persons.

It would not be prudent to accept these findings as they stand, though the method is a proper one. The numbers chosen, particularly in the neurotic group, are far too small for it to be certain that the sample is representative; in support of this objection is the fact that 20% of the neurotic subjects, and 38% of those in the mental hospital are reported to have shown homosexual traits—a remarkably high proportion. It would be necessary to know how the men were selected, how far the history of their past lives was obtained from reliable sources, and whether the men of the Medical Corps unit in question differed in any material respect from the average run of men in other branches of the Service. It is also open to question whether a healthy man takes as much trouble in giving full replies to a questionnaire about his personality and history, especially in its more shadowed aspects, as a patient with a psychiatric illness. Nevertheless, further investigations of this sort on a larger material would be welcome, and the recommendations put forward by Steinberg and Wittman deserve attention. They point out that any one specific factor or symptom is of limited importance since it may occur also in well-adjusted persons, but that the intensity and number of such factors, recorded as a numerical value or score, provides a useful indicator which might well be used as a routine measurement of predisposition. A rating form satisfactorily standardised and so arranged as to indicate how the man had reacted to army life can be filled out by the immediate superior officer or medical officer of the man's unit and is very helpful to the psychiatrist to whom he may be referred.

1. Steinberg, D. L. and Wittman, M. P. War Medicine, August, 1943, p. 129.

REGENERATION OF NERVE

KNOWLEDGE of the rate of nerve regeneration is useful for determining the time at which recovery may be expected after nerve suture, and still more important in cases where nerves have been injured but not sutured. Absence of exact information about the time at which spontaneous recovery may be expected probably leads to undue delay before exploratory operation in many of these cases. The rate which is required is of course not that of the advance of the tips of the new fibres. Thin nerve-fibres may reach a muscle long before it shows recovery. Before the new stretch of nerve can function the nerve-fibres must thicken and medullate. By studying the time at which function returns in muscles at various distances from the lesion we can therefore estimate the rate of advance of what may be called functional completion[1] along the nerve. Seddon, Medawar and Smith[2] have made a careful study in this way of the rate of recovery in 25 cases, mostly in the radial nerve. The distance from the lesion (or suture) to the various muscles was estimated from a series of dissections. Recovery was found to take place in a regular serial manner, but plots of the distance of each muscle from the lesion against the time of recovery often do not give straight lines, suggesting that regeneration is fast at first and becomes slower for the more distal muscles. There is, therefore, no constant "rate of regeneration." The data are not sufficient to allow the shape of the curve describing the decline to be discovered accurately, but Seddon and his colleagues suggest that it may be a hyperbola, the rate being inversely proportional to the square of the time, beginning as high as 3 mm. a day,

1. Young, J. Z. *Physiol. Rev.* 1942, **22**, 318.
2. Seddon, H. J., Medawar, P. B. and Smith, H. *J. Physiol.* 1943, **102**, 191.

and falling to about 1 mm. a day at 100 days or so after recovery has started. This would agree with the findings of Gutmann and others [3] that regeneration to the level of functional completion may proceed down the short nerves of rabbits as fast as 3·5 mm. a day. Until more is known of the course of decline in the rate of recovery average values can be used for comparing the results after different types of lesion. The rate per day in the radial nerve after suture was found to be 1·6 mm. as the average of 6 cases, with variations between 1·0 and 2·4 mm. In 10 cases of "spontaneous" recovery (axonotmesis) the average rate was 1·5 and the limits 0·7 and 2·1 mm. per day. The rate of recovery in 14 cases of suture of radial nerve described by Stopford [4] can be calculated in the same way, and proves to be only 0·6 with extremes of 0·4 and 0·7 mm. per day. The reason for the strikingly faster rate in the recent cases remains obscure. The possibility of making such comparisons shows the value of the method. It is to be hoped that with the careful following of cases now being undertaken at the various nerve injury centres still more exact estimates and further information about the variables which affect the rate of nervous regeneration will be obtained. This should help considerably in the diagnosis, prognosis and management of these cases in which the long delay before recovery is such a difficult feature.

FEEDING THE EAST AFRICAN FORCE

THE Africans serving in the campaign which restored Abyssinia to the Abyssinians were drawn from nearly 200 tribes. In a single round at the large base hospital for African soldiers at Nairobi it was possible to see men from Nigeria, the Gold Coast and other colonies on the West Coast, black and coloured men from all parts of South Africa, and tribesmen from the Rhodesias, Nyasaland, Kenya, Uganda and Tanganyika; Somalis and occasionally Abyssinians. Most of these people had their own dietetic preferences and different methods of preparing their food, and the difficulties of catering for such a heterogeneous collection of people seemed almost insuperable in hospital. On active service conditions were naturally different, and every race, with the sole exception of the Somalis, accepted the common Army ration. This remarkable breakdown of the innate conservatism of the African in the matter of food—a conservatism which is held to be responsible for much of the malnutrition in Africa—should, as Farnworth Anderson [5] points out, have a considerable influence when these thousands of men return home. A former director of Army Medical Services in East Africa reported that the low incidence of disease in the troops was largely due to the fact that the supply of food had been on the whole well maintained. During the first year the deaths from sickness in the African troops stood at the remarkably low rate of 3·4 per 1000 per annum. Anderson records that the average admission-rate to hospital for food-deficiency diseases between June, 1940, and the end of 1942 was only 0·72 per 1000 per annum. Deficiencies of vegetables and fruit were overcome to some extent by the issue of ascorbic acid tablets imported from home. These were later replaced by sweet capsicum or paprika, sprouted pulses and native beer, and by dehydrated vegetables produced at Keruguya in Kenya. Large quantities of these dehydrated vegetables were later sent to the Middle East. Patients with vitamin-A deficiency were given ghee and red palm oil. Calcium was supplied where required by the addition of bone-meal or precipitated chalk to the cereals. A local outbreak of beri-beri from unpolished rice used by the Somali was rapidly controlled by the issue of a millet sorghum. While giving due credit to Brigadier Orenstein and his colleagues in the medical department for these satisfactory results, high praise must also go to the supply and transport services, working over lines of communication often 2000 miles long, and using roads which in many parts were almost impassable.

3. Gutmann, E., Guttmann, L., Medawar, P. B. and Young, J. Z. *J. exp. Biol.* 1942, **19**, 14.
4. Stopford, J. S. B. *Brain*, 1920, **43**, 1.
5. Anderson, T. F. *E. Afr. med. J.* 1943, **20**, 297.

CHEST TROUBLES AFTER HERNIA OPERATIONS

THE chief bugbear of the anæsthetist is still post-anæsthetic trouble in the respiratory tract. The development of such trouble is probably determined much more by the site of the operation than by the anæsthetic agents or lack of skill in their employment. At the Royal Society of Medicine on Nov. 5, Squadron-Leader B. G. B. Lucas gave figures showing the prevalence of chest complications after operations for hernia on men in the RAF. Every operation which damages the abdominal wall is liable to be followed by such complications, because the pain caused at the site of the wound by a cough induces the patient to avoid coughing and deep breathing. The diaphragm, too, is often inhibited on the damaged side. Secretions collecting in the air-passages are thus not dislodged. The ensuing complications may take the form of lobular atelectasis, sometimes of lobar atelectasis—which is of greater import—and sometimes of frank bronchitis. Many of the patients simply had coughs after operation with no physical signs or rise of temperature. In most patients trouble was slight and over in a few days, but in the worst series 14% of the patients had severe trouble. A great variety of anæsthetic methods were tried in order to see whether the anæsthetic could be incriminated. The number of patients with subsequent chest trouble remained about the same, whether regional analgesia with or without chloral, 'Pentothal' alone or pentothal with gas and oxygen, or gas and oxygen and ether was employed. It is noteworthy that a large number of patients had a cough before operation, generally attributable to smoking. One speaker at the meeting brought forward evidence that smokers suffered much more often than non-smokers from respiratory trouble after operation. The most effective treatment, according to a consensus of opinion at the meeting, is to be found in breathing exercises begun before operation and carried out systematically for some days afterwards. Being mechanical in origin the condition can be prevented mechanically.

THE COPLEY MEDALLIST

THERE is a paradox about the first breath as there is about the maiden voyage of a steamship. Behind the initiation of the vessel's functional life is a background of trial trips, assemblage of parts, fitting of machinery and all that. Sir JOSEPH BARCROFT has shown that the movements responsible for the first breath have a history that can be traced back to the very first efforts of which the fœtus was capable. The captain and the accoucheur have been too deeply engrossed in the safety of their precious charge to observe and experiment. The Copley medal has been won by the physiologist who has within a period of five years filled an age-long gap in our knowledge of the act of birth. The achievement was not simply a flash of insight but the sequel of life-long inquiry—here, there and everywhere—into the mechanics of respiration, and conveyed with the inimitable descriptive faculty of one fortunate to draw his own first breath in co. Down.

"... When a man is taken to a certain hospital in the East End of London with a broken leg the hospital telephones to his employer saying that he will be fit for work in such and such a time, and asks if his place will be kept open for him. The employer says 'Yes' and the man is told at once. His mind is at peace, and since this has been done there have been no cases of traumatic neurasthenia at this hospital."—Lord MORAN, in a letter to the *Times* of Nov. 3.

Special Articles

THE PHYSIOLOGICAL ANATOMY OF HEALTH CENTRES

So far, relatively little thought has been given to the design of health centres. In hospital planning structure must of course be determined by function, and the same must apply to other buildings used for health purposes. The external and internal architectural treatment are likely to have some psychological significance both for the public who will have to adapt themselves to the new conception of group practice, and for the staff of the centre, whose work must to some extent be modified by the milieu in which it is done.

A number of examples of health centres to house municipal health services already exist. Bristol has been a pioneer in this respect; in the last seven years, one main and four branch centres have been built; their weekly attendance is about 10,000, and the main centre is already too small. Two of the centres at least provide radiological facilities available to the general practitioners of the city. The Finsbury borough health centre is small but attractive; an original and popular feature is a clinic for foot ailments. Another small municipal centre is that of Darwen, opened in November, 1942. This centre is situated within easy access of any part of the borough, and the premises are well built and suitable for clinical work; but experience has already shown one or two slight defects which may serve as a warning to other designers. Public health and sanitary services, child welfare, antenatal and postnatal clinics, school medical services and such subsidiary services as orthopædic and school dental clinics, speech therapy, child guidance and diphtheria immunisation are all housed in or operated from the centre. Since it was established the public have made fuller use of the health services. Proposals for a series of main and subsidiary centres in Manchester were described in a recent issue,[1] and an impression of one of these main centres may now be added (fig. 1).

These municipal centres give only limited guidance when proposals for general practitioner health centres are considered. An attempt to meet this specific need has been provided by the Medical Practitioners Union.[2] It was disappointing to see the factory-like elevation of their proposed building, and the rows of seats in the diminutive waiting-rooms reminiscent of the poorer type of lock-up surgery. Moreover there is a danger that if it is left alone in the field this type of centre might be adopted in principle by the Ministry of Health, and model plans based on inadequate proposals might be issued to local authorities. Much more stimulating are the designs of Lionel Pearson, FRIBA. A careful study of Mr. Pearson's plan (figs. 2 and 3) shows that function has determined structure at every stage; and the result is a building of real charm.

CHOOSING THE SITE

The needs are: adequate lines of communication for the patients and staff; reasonable quiet; and adequate space.

The patients attending a health centre are going to be drawn from an area considerably more extensive than that covered by the average doctor's surgery. Having decided the area—the margin of which cannot be absolutely precise since choice of doctor, and hence of centre, is to be at the patient's discretion—it will be necessary to study carefully a map showing:—

1. Density of population, and location of dwellings.
2. Public transport services (frequency of running should be known).
3. Natural foci of community life such as shopping centres, cinemas, schools, public libraries, and municipal offices.

Sites having suggested themselves, possibly adjacent to or behind shopping centres, it will then be useful to check how long it will take residents at a dozen places on the periphery of the area to reach each site. Sites should be near, but set well back from, main roads. Medical officers of health might do well to select a few possible sites in advance, and discuss them with the town planning officers of their authorities, particularly where air-raids have done substantial damage.

EXTERNAL NEEDS

There must be a covered parking place for prams, push-chairs, bicycles and invalid chairs, immediately adjacent to the main entrance. Since most of the medical staff will probably come and go by car, there should be a covered parking place for the doctors' cars, wide enough to allow any car to leave without displacing the others. It is anticipated that at least one assistant doctor will be resident at the centre, and he may be called out to visit patients in their homes; further, it may be convenient for the doctor on night duty to leave his car at the centre; so at least two lock-up garages should be provided. Patients may have to be removed by ambulance, and it will avoid gaping sight-seers if a back approach for ambulances and lorries is provided.

An open-air playground will be needed—particularly where children's clinics are held. A part of this might

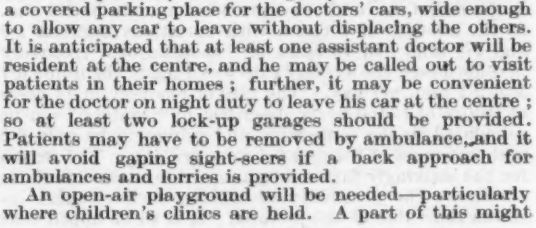


Fig. 2—Design for a family health centre by Lionel Pearson, FRIBA.

be roofed in as in Mr. Pearson's plan. Finally a garden for the resident and other staff would be welcome.

INTERNAL NEEDS

Since the essence of the centre is preservation of the doctor-patient relationship the main entrance should be the entrance for everyone. The day when patients were passed round the side, like tradesmen, must surely be over.

Mr. Pearson has divided his centre into three sections: a central one with the common services, a left-hand section containing the general-practice department, and a right-hand section for clinics and dentistry. In principle this seems a sound arrangement.

On entering, the patient's first port of call must be the registry. Here he would be issued with a card giving an appointment number, and the clerk would immediately send his records through to the doctor's consulting-room. The circulation in Mr. Pearson's plan might be eased by reversing the position of the clerical registry and the X-ray room. The registry should include not only a record room, an appointments register, and a typing pool, but also a room for one or more social workers.

The patient, with card, will now go to the main waiting-room. This should be reasonably large, comfortably furnished, and cheerfully decorated. It should have a lavatory for each sex adjacent. Each doctor would signal for his next patient by pressing a numbered button on his desk, when a soft buzzer would sound in the waiting-room and the number on the patient's card would be illuminated beneath the doctor's name.

It is assumed that doctors will collect and examine specimens in their consulting-rooms. The microscopic examination of urine in particular should certainly not be delegated to anyone else. Blood for tests will also be taken in consulting-rooms, though blood-counts and other investigation will be done in a common laboratory. Each consulting-room should have a weighing machine, an X-ray viewing screen, a built-in sphygmomanometer over the couch, and a good blind for darkening the room for ophthalmoscopic examinations. In the patient's note-file will be a treatment and certificate card, on which the doctor will write his prescription, adding his

1. *Lancet*, 1943, ii, 490. 2. *Ibid*, 1943, ii, 365.

initials in columns marked for the appropriate certificates—a process taking perhaps 30 seconds. The patient, having been instructed about when to report again, will then leave with his treatment card and go to the dispensary. While medicine is being prepared, he will sit in the waiting-room, and when it is ready he will take the treatment card to the social worker who will issue him with the appropriate certificates, stamping them with the doctor's signature. Any special points the doctor wishes the social worker to take up will also be noted on the treatment card, which will then be returned to the record department. All the patients' notes will be collected at the end of the session. All rooms should be linked by an internal automatic telephone, so that, for example, any doctor who wishes to call in a colleague to see an interesting or difficult case may easily do so.

In addition to a small clinical laboratory, the general-practice section should contain two surgeries—one for clean cases and plaster work, and one for infected cases—with a surgical waiting-room (equipped with simple resuscitation apparatus for accidents), a common anæsthetising room, and two recovery rooms.

The section for clinics and dentistry might again well centre round a large waiting-room—or better two waiting-rooms, since those with toothache are hardly likely to welcome infants also waiting. The clinic waiting-room should have adequate lavatory accommodation, including special accommodation for children, close at hand. The doctors' examination rooms—there should be at least two—should open out of nurses rooms where babies can be weighed and mothers prepared for examination. There should be rooms for the treatment of dirty children and minor ailments; and one or two rooms where domiciliary midwives can keep their records, and store and sterilise their instruments. The dental section might include a special extraction room, a mechanic's room, and a dental nurses room, in addition to the dentists consulting-rooms.

In the central block, Mr. Pearson includes a large lecture room, an X-ray department, and an electrotherapeutic and massage department. It is suggested that the central block should have three floors. The first should be devoted to common staff-rooms, while the top floor should provide two flats for the assistant general practitioners, and a third flat for a resident caretaker. On the first floor there should be a common canteen for all the staff—doctors, dentists, nurses, social workers, clerks, and technicians—on the cafeteria system, with the necessary kitchen and scullery. There should also be a small committee room, a large common smoking-sitting room, and a library—though this might be combined with the committee room.

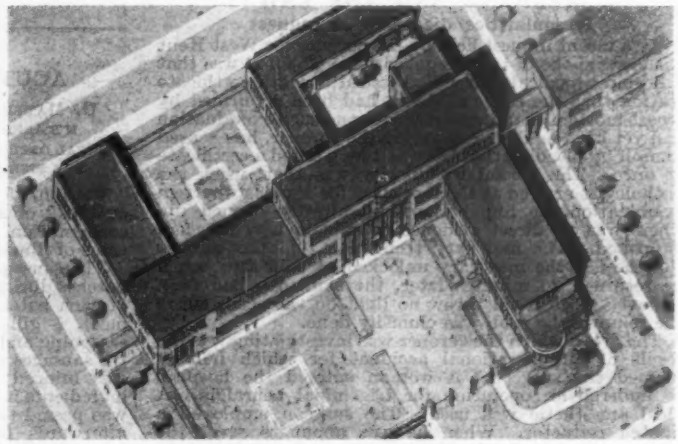


Fig. 1—Design for a municipal health centre by G. Noel Hill, FRIBA, MTPI, taken from a report on health centres presented to the Manchester Public Health Committee on Sept. 16, 1943, by the Medical Officer of Health.

THE COUNTRY DOCTOR

In rural areas, the ideal plan would be to combine the necessary facilities for health work in each village with other social service needs, to produce a village community centre. The district nurse's room, the doctor's surgery—visited, say, twice a week for general clinics and once a week for maternity and child welfare clinics—and a small dispensary, might open out of a waiting-room which on other occasions became the village hall. In addition, under the same roof there might be a British Restaurant and school canteen, the village library, a young people's club-room, and a committee-room.

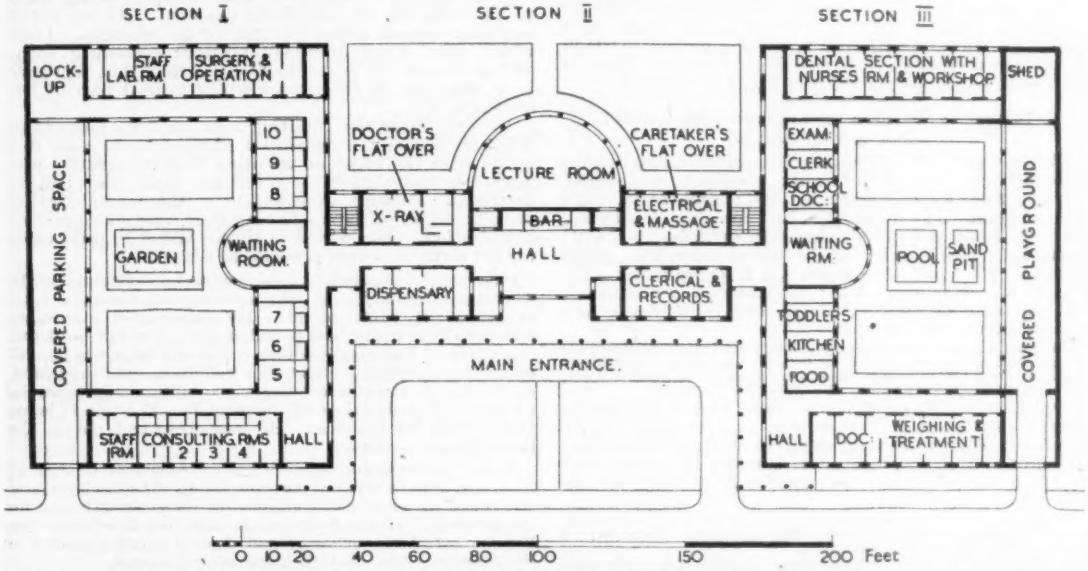


Fig. 3—Layout plan of the centre shown in fig. 2. Section I: General practitioners' consulting-rooms with cooperating medical services. Section II: lecture room and special departments. Section III: maternity and child welfare, school and dental clinics. Figs. 2 and 3 appeared in *Architectural Design and Construction* 1943, 13, 61, and are reproduced by kind permission of the Editors and Mr. Pearson.

MEDICINE AND THE LAW

Irregularities disclosed at Inquest

AT a recent inquest held by the coroner for West Kent witnesses spoke of two irregularities. The first was that a hospital medical officer had issued a death certificate stating that the cause of death had been confirmed by a post-mortem examination whereas no such examination had yet been made. Answering the coroner, he excused himself by pleading that the relatives wanted a certificate at once. The second irregularity was that, when the pathologist arrived at the mortuary for the post-mortem examination, he found the skull already opened up. There was no direct evidence to explain how this had happened. The mortuary technician told the coroner that he left the mortuary unlocked at 9.55 AM; when he returned 20 minutes later, the skull cap had been removed. He could throw no light on the occurrence; the removal, he said, was clumsily done.

The death which the coroner was investigating was the result of an operational accident for which nobody blamed the surgeon. A woman entered the hospital to undergo an operation for trigeminal neuralgia. A local anæsthetic was used. The surgeon employed a lighted retractor. When he was about to sever the nerve, a nurse who had patted the patient's hand to reassure her, reported that she felt an electric shock; feeling faint, she was told to switch off the current and leave the theatre till she recovered. The surgeon could hardly pause to ascertain the source of the nurse's shock; the fact that the retractor bulb had not burned out seemed to negative the passage of abnormal current down the machine. Suddenly the patient went into an epileptic fit; hæmorrhage began and had to be arrested; the operation was not completed; the patient was taken back to the ward where she died. There was evidence at the inquest of previous complaints of the electric transformer, surgeons having received minor shocks. The apparatus had been sent away to be overhauled; the trouble on this occasion, according to an electrical engineer, was a short circuit.

The jury, while absolving the surgeon from all blame, criticised the unsatisfactory service of the electrical apparatus, the issue of a false death certificate, and the lack of supervision at the mortuary. The coroner commented on the delay in notifying a death at a hospital when an inquest seemed necessary. Bereaved relatives, he observed, were sometimes told at a hospital that no inquest or post-mortem examination would take place; the authority of the coroner was thereby usurped. The result was that relatives made arrangements with undertakers for the funeral and then were greatly distressed if the coroner had to intervene. He suggested that he should be notified within 12 hours of the death of a mental patient and within 24 hours of other deaths which required investigation. If this were done, the family's distress to which he had referred would be avoided.

Infectious Disease in England and Wales

WEEK ENDED OCT. 30

Notifications.—The following cases of infectious disease were notified during the week: smallpox, 0; scarlet fever, 3623; whooping-cough, 1693; diphtheria, 702; paratyphoid, 5; typhoid, 7; measles (excluding rubella), 585; pneumonia (primary or influenzal) 576; puerperal pyrexia, 196; cerebrospinal fever, 26; poliomyelitis, 13; polio-encephalitis, 1; encephalitis lethargica, 0; dysentery, 248; ophthalmia neonatorum, 75. No case of cholera, plague or typhus fever was notified during the week.

The number of civilian and service sick in the Infectious Hospitals of the London County Council on Oct. 29 was 1978. During the previous week the following cases were admitted: scarlet fever, 206; diphtheria, 53; measles, 11; whooping-cough, 44.

Deaths.—In 126 great towns there were 2 (0) deaths from enteric fevers, 2 (1) from measles, 1 (1) from scarlet fever, 3 (2) from whooping-cough, 21 (1) from diphtheria, 55 (4) from diarrhœa and enteritis under two years, and 25 (4) from influenza. The figures in parentheses are those for London itself.

Wakefield and Cambridge each reported 1 fatal case of enteric fever. Birmingham had 6 deaths from influenza. There were 8 fatal cases of diarrhœa at Liverpool.

The number of stillbirths notified during the week was 208 (corresponding to a rate of 34 per thousand total births), including 20 in London.

Public Health

OUTBREAK OF ACUTE ARSENICAL POISONING

G. MATTHEW FYFE
MB ABERD, D P H
MEDICAL OFFICER OF HEALTH FOR FIFE COUNTY

B. W. ANDERSON
M D ST. AND, D P H
DEPUTY MEDICAL OFFICER OF HEALTH FOR FIFE COUNTY

ON Jan. 15 and 16, 1943, in St. Andrews, there was an outbreak of acute arsenical poisoning following on the consumption of sausages and resulting in at least 150 cases of illness and 2 deaths.

The sausages were made in a butcher's shop in three batches during the forenoon of Jan. 15. The ingredients of each batch were: 10 lb. meat and fat, 15 lb. biscuit meal, ¼ gill sulphur dioxide preservative, 1 lb. pork seasoning and 10–12 pints water. The duty of preparing the sausages was shared between 3 assistants. The meat was minced and subsequently mixed with the other ingredients in a large galvanised iron bath. The mixture was passed through the mincer and more than half was afterwards fed into a sausage-making machine, the remainder being retained for sale as sausage meat. None of the workers in the shop would admit to any departure from this procedure, addition of another ingredient or to the possibility of interference by another person.

COURSE OF ILLNESS

The three batches were sold as sausage meat and as sausages to the general public and to a students' hostel. Symptoms followed rapidly after consumption. The first cases occurred in the students' hostel where sausages from the third batch were eaten at lunch. Approximately 90 men were affected. The illness was fairly severe while it lasted but only one man sought medical attention. Later in the same day and on the following day cases of acute illness occurred throughout the town and subsequent investigation showed that only those who had eaten this foodstuff were affected. Those who partook of the first batch manufactured reacted more severely than those who ate from the second and third batches. Medical advice was sought in many cases and the attention of the public health department was directed to the occurrence on the afternoon of Jan. 16.

Most of the patients experienced epigastric discomfort within a few minutes of eating the food and most cases vomited violently 5–15 minutes later. Some patients felt discomfort before they had finished eating their portion and left the remainder uneaten. No one noted anything unusual about the taste of the sausages. Dogs which were given discarded portions consumed them and were sick. Cats declined to eat them but this may have been due to the pepper which formed part of the seasoning.

In some cases the vomiting continued for more than 8 hours. Diarrhœa developed in most cases some 3–6 hours after the onset of vomiting, but its severity was much less than that of the vomiting: some cases had no diarrhœa. Patients were left in a state of exhaustion or collapse, all of them suffering from varying degrees of dehydration. The period of illness lasted in mild cases for 3–4 days, in severe cases up to 6 weeks.

CASE 1.—A man, aged 52, consumed for breakfast on Jan. 16 4 sausages containing, it was subsequently found, a total of gr. 45 of white arsenic. He experienced immediate abdominal discomfort and pain but did not vomit until two hours later. Vomiting was then severe and later was accompanied by diarrhœa. He became collapsed and dehydrated, and although towards evening his condition improved, he relapsed and died in the early hours of Jan. 17, some 17 hours after eating the sausages. He was obese and not in the best physical condition.

CASE 2.—A woman, aged 48, ate for breakfast on Jan. 17 3 sausages purchased from the same batch. Half an hour later she began to vomit and continued to do so for 6 hours, for the latter half of which period she also had diarrhœa. She became extremely collapsed and showed much evidence of dehydration. She died 12 hours after ingestion.

The main findings on post-mortem examination were identical. The stomach was congested, greatly distended with

gas and contained fluid. The congestion and distension continued throughout the length of the duodenum and gradually lessened in the course of the jejunum. The ileum was not distended but was slightly hyperæmic. In the male the large intestine was normal in size and in appearance; in the female it was contracted and pale. The mucous membrane of the stomach, duodenum and jejunum showed acute inflammatory changes. The only other abnormalities found were of long standing. In the female there were extensive old pleural adhesions and in the male fatty infiltration of the liver, a heavy deposit of fatty tissue on the heart wall and one or two small nodules and points of thickening on the aortic valve.

INVESTIGATION

Although symptoms pointed more to an irritant poison as the cause of the outbreak, specimens of sausage-meat, of stomach and bowel contents, and of abdominal organs were submitted as a routine for bacteriological examination. The bacteriologist's report showed that while a few staphylococci were present in the sausage-meat, they were insufficient in number to account for the development of an enterotoxin. Cultural examination failed to display in any specimen the presence of any micro-organisms of the salmonella or dysentery groups.

On specimens of sausages and sausage-meat sent for chemical examination the analyst reported as follows:

First batch.—Three samples of sausages analysed contained 98, 99·4 and 102·4 grains of white arsenic per lb. (The first and third of these samples were part of the lots actually eaten by the 2 persons who died.)

Second batch.—The sausage-meat contained gr. 9·54 per lb.

Third batch.—The sausages contained gr. 4·16 per lb.

The arsenic was present in each sample in the form of arsenious oxide (As_2O_3) and the relative quantities indicated that the arsenic was added to the first batch only and that successive batches were affected by the residues carried over from one making to the next. A sample collected from a fourth batch manufactured on the morning of Jan. 16 contained only gr. 7/125 arsenic per lb. Only one family made purchase from this batch and consumed the meat with no adverse effect.

Assuming this method of introduction to be correct, since the weight of a batch of sausage-meat was between 35 and 40 lb. approximately one-half pound of pure white arsenic had been added to the first batch of sausage-meat. The first batch was sold to the general public and, as has been stated, the cases of illness so produced were much more severe than those in the students' hostel to which parts of the second and third batches had been sent, or among 3 of the shop employees who also partook of the later batches.

Arsenious oxide was found present in the stomach and bowel contents and in the abdominal viscera of the 2 fatal cases in quantities sufficient to cause death.

Chemical analysis was made of all the materials used in the making of the sausages—seasoning, preservative, biscuit meal, salt and skins, and also of the contents of all packages, tins, bottles, bags, &c., found in the shop. No trace of arsenic was found in any. Examination of dust from the pockets of the workers gave negative results. The butcher-meat from which the sausage-meat was made was cut from a large portion of a carcase which was otherwise consumed by the public without injurious effect.

On April 27—101 days after consumption of sausage-meat—specimens of urine, fæces and hair were obtained from 2 men who had been ill. These were sent for analysis. The specimens of fæces contained 0·2 and 0·5 parts As_2O_3 per million respectively while the urine contained 0·05 and 0·15 parts per million. No arsenic was present in the hair. Neither of the two men had in the interval been taking any preparation containing arsenic.

After it had been established that the cause of the outbreak was not of bacterial origin, investigation was continued by the police but no evidence was found as to how the arsenic was added to the sausage-meat, or as to its source. All local purchases of arsenic from chemist shops and other premises were checked. Sales by wholesalers over a wide area were investigated. Stocks in local laboratories were found to be intact. It is to be presumed, therefore, that the white arsenic used was purchased some considerable time ago by some person unknown.

DISCUSSION

The fact that the arsenic was present as pure arsenious oxide probably excludes purchase from sellers of poisons listed in part II of the poisons list (Poisons List Confirmation Order, 1935). If the arsenic was purchased, it is more likely to have been bought from a retail or wholesale chemist or obtained from a manufacturing firm. The poisons rules are so framed that a private person can purchase white arsenic only if:

(*a*) he is known to the seller as a person to whom this poison may properly be sold or is certified in writing by a responsible person known to the seller to be a person to whom the poison may properly be sold; and

(*b*) he signs the poisons register and indicates the purpose for which the poison is to be used.

An improper sale under such conditions can hardly be envisaged in these days. Further, the sale of certain arsenical compounds (and these include the oxides) is prohibited if these are intended for use in agriculture or horticulture, for the destruction of bacteria, fungi, insects, vermin or weeds, unless there has been added a dye of distinctive colour and soluble in water (Poisons Colouring Rule, 1936). These provisions restrict the sale of white arsenic, but a great responsibility rests on the seller since he has to be satisfied not only as to the person receiving the arsenic but as to the purpose for which it is to be used.

Although none of the chemists' shops visited held larger quantities of arsenious oxide than 2 oz., investigation did reveal an alarming fact—namely, that a rat-catcher, living in an adjacent county, had purchased no less than 80 lb. of pure arsenic in the course of the last 2 years. This arsenic was bought in 10 lb. lots from a retail chemist and it was not coloured.

Again, while the rules concerning the retail sale of arsenic are reasonably strict, they do not apply to wholesale dealings or to the sale by wholesalers or manufacturers to persons who regularly use arsenic in the manufacture of other articles. If white arsenic be required for the purpose of a trade, business or profession, an order has to be signed specifying inter alia the purpose for which the arsenic is required, and here again the seller has to be "reasonably satisfied" as to the propriety of the proposed purchase.

There is, therefore, an unexpected number of persons who can purchase, or who have access to, white arsenic. Furthermore, while the rules governing storage apply to types of containers, transport and storage in retail shops and institutions, they do not apply to storage after purchase so that there is always the possibility of arsenic getting into the hands of unauthorised persons. As an example, one might instance the ease with which arsenic could be removed from a laboratory. If it is not practicable to strengthen the Act governing the sale of poisons, all buyers should be seriously warned that arsenic should be used only for the purpose declared at the time of buying and they should be obliged so to store the poison that there is no possibility of it being used in error for some other purpose or of it falling into the hands of any person unauthorised to possess it. At the same time, steps should be taken specially to stress the great responsibility which rests with persons selling arsenical compounds to see that they get into the hands only of persons who have a proper use for them.

SUMMARY

An outbreak of acute arsenical poisoning due to consumption of contaminated sausage-meat is described, involving at least 150 cases of illness and 2 deaths.

Arsenious oxide in pure form was recovered from the sausage-meat in amounts ranging from gr. 7/125 to gr. 102·4 per lb.

The source of the arsenic was not traced.

Traces of arsenic were still present in the fæces and urine of patients 101 days ofter consumption.

It is suggested that steps be taken to provide further safeguards in the sale and storage of arsenic.

ROYAL MEDICO-PSYCHOLOGICAL ASSOCIATION.—At 10.30 AM on Wednesday, Nov. 24, at 1, Wimpole Street, W.1, there is to be a discussion on postwar psychiatry, continued at 2 PM.

In England Now

A Running Commentary by Peripatetic Correspondents

SOME enterprising publisher might do much good, though he wouldn't make much money, by producing a hospital phrase-book. In our medical ward at the moment is a wretched Italian prisoner with some obscure kind of jaundice which makes him feel very ill and needs a lot of investigating. He can speak no English and none of the medical or nursing staff has a word of Italian. The difficulties involved in his treatment, and particularly in his nursing, can well be imagined. There must be many foreigners with no more than a rudimentary knowledge of English in British hospitals here and abroad just now, and our responsibilities in this direction are likely to get steadily heavier. What is needed is either a single phrase-book covering the likely languages—French, German, Italian, and perhaps some central European and Scandinavian tongues—or a series of phrase-books covering one language each. The phrases would include the essential questions which the doctor or nurse may want to ask, and the explanations of treatment or routine they may have to make; and, from the patient's point of view, symptoms, likely requests and so on. A committee including an experienced ward sister or two could without much trouble draw up a list of phrases which would be an immense help though it could not cover every eventuality.

* * *

Dear opponents-of-nursery-schools, have you ever watched a mother entertaining her little one on board a Clyde steamer? This is how it goes:—

"Maw, what kind o' a ship is this?"
"Sit doon an' haud yer wheesht." (pause)
"Maw," as he points to the lovely range of Arran peaks, "what hills is these?"
"A dinna ken; sit still." (interval)
"Maw, what's a submarine like?"
"Here's a sweetie, an' shut up." (long pause)
"O maw, come an' see this big ship."
"Come aff they railings or I'll skelp yer backside."

This apparent severity is not really vicious; it is simply due to lack of training. Many of these mothers have no stories to tell to children and are devoid of any means of interesting them. In consequence they divide their time between useless scolding and an equally senseless coddling. The child of this type is generally master of the household and he knows it. His whims determine the food that is eaten and rejected and the whole family revolves round him. The serious question is, how do these half-pampered, half-bullied children look when they are grown up?

I can't pretend to give a studied answer; but my friend M was in a crowded train near Stirling the other day when two women holding babies had to stand beside him in the compartment while a boy of sixteen or so sprawled across a corner seat in luxurious ease, smoking a cigarette and reading a book entitled *The Boy Racketeer*. Perhaps the clue lies there. The girls are much the same: in my hospital we often get probationers who on their own confession have never made a bed or a semolina pudding. "O, mother always did that!" Then I am moved to think of Weir of Hermiston, who knew something of the world: "Gie me a lassie that can plain boil a potato, and I don't care if she be a whure off the streets."

* * *

This morning one of my patients knocked the conceit out of me in no uncertain manner. He was an elderly man from whom I had removed a gangrenous appendix four days previously, and he had made an uneventful recovery. "I've made a wonderful recovery, haven't I, doctor?" was his sighting shot, to which I readily agreed. Then, "In fact I've recovered far more rapidly than you at first anticipated." It was obviously up to me to fall in with this perfectly true suggestion but his face lit up as he saw my guard lowered and my chin exposed for his knockout. "I can now let you into my little secret. As soon as my doctor told me that I had to have an operation and that you were coming to do it I realised that my condition was pretty desperate. I sent immediately a cable to an old friend, a faith healer, now in Hobart, Tasmania, telling him of my plight. He replied at once 'I am treating you. Don't worry.' Surely your admission that I got on more quickly than you expected proves that my friend's treatment has been successful." I did my best by murmuring humbly, "All the same I did remove your appendix." Quick as lightning he came back at me, "Yes, but my friend was there in spirit to aid your decisions and to guide your hand." What more was there to say? I took the count.

* * *

One of your correspondent's notes about illegible prescriptions started a conversation about some other vagaries of prescribers. One of the circle told us he made a hobby of collecting unusual and curious prescriptions and he had just acquired a new specimen. It read:

℞ Antim. pot. tart. BP	..	·0083% w/v
Ammon. acet.	..	1·8%
Tinct. opii BP	..	·234% v/v
Acid benzoic.	..	·0234%
Camphor	..	·0140%
Ol. anisi	..	·0140%
Ethyl nitrite	..	·12%
Spt. vini rect.	..	3·78%
Glycerin	..	3·125%
Trichloromethane	..	·125%
Tinct. senegæ	..	1·561%
Aqua ad.	..	100%

Mitte 20 oz.

"Were I a pharmacist faced with this," he said, "I would feel like beating my head against the wall. And if it appeared as a NHI script for which I was to receive 5*d*. as dispensing fee, my blood-pressure would rise dangerously." There was general agreement, but another pointed out it had all the appearance of being some proprietary which the doctor did not wish to prescribe by name, and knew the pharmacist would recognise; and so long as the pharmacist knew what it was he could dispense the ready-made mixture. Still if he didn't know it heaven help him! "But why on earth," I asked, "didn't the doctor prescribe the proprietary cough-stuff by name? He couldn't have thought he wasn't allowed to; or could he?"

* * *

An end to all this arrant nonsense about the glorious liberties of medicine as it is practised at the moment! The would-be consultant now has to stoop to all sorts of intellectually humiliating devices such as coaching (the prostitution of intelligence), performing hack work for "coaching colleges," or lecturing on anatomy or physiology at nights in obscure suburban technical colleges. In the intervals of such work he "devils" as no young barrister would ever be expected to in various hospitals, doing the greater part of the work of the hospital without any emolument in order that the honoraries may spend more of their time trying to collect the wherewithal to pay for the absurd standard of living set up by "Harley Street," and the hospital can pretend to pay its way. How can we expect young men trained in such a school to have any respect for the Hippocratic ideals? How could state medicine ever produce conditions more inimical to the mental and moral development of the so-called leaders of the profession? In general practice the same outlook prevails—what member of the profession is honestly capable of dealing with a waiting-roomful of 40 patients in two hours? Even the most experienced of consultants find that ¼ hour is the minimum time in which he can cope with one patient. How can the GP, who has been up all night attending one or more confinements, possibly do justice to a full day's programme next day?

I am no advocate of state medicine, but honesty compels me to wonder whether an efficiently run state system of medicine could possibly be worse than the present one.

* * *

The changing of the Guard at Buckingham Palace seems less impressive than it used to be, partly, no doubt, because one has grown more critical with the years and partly because khaki (especially battle-dress) has less æsthetic appeal than full-dress. The slow marching, however, is still almost up to Tattoo standard and the dressing and steadiness on parade leave nothing to be desired. I was a little shocked the other day to notice a corporal carrying his rifle at the slope with a downward slant of his forearm. That would never have done for my old chief, the Duke of Wellington. Or do I mean Earl Haig? It is hard to remember, it was all so long ago.

Parliament

ON THE FLOOR OF THE HOUSE

MEDICUS MP

AT the end of the first world war the chief problem was one of employment; at the end of this war the main problem, and this time a world problem, will be food. The debate on the Indian food situation, the famine in Bengal and near famine in other provinces, threw a grey light on this problem which reveals no place for optimism. The debate was opened by Mr. Pethick-Lawrence, who firmly fixed the responsibility for major decisions on the House of Commons. "We are all Members for India," he said; "the main cause of the famine is that there are large numbers of people in certain provinces in India who have not the purchasing power to enable them to buy such food grain as will keep them alive." Prices have risen steeply, the general index about 300%, the price of consumer goods such as cotton and kerosene which the peasant wants to buy by some 400–500%, of food grains by about 500–700%, and of certain commodities by as much as 900%. This is grave inflation, and Mr. Pethick-Lawrence said there was no mystery as to what had caused it. "It is the spending of huge sums in India by the Government of India and by the British Government and the printing of paper money in order to pay wages and the rise in the costs of production without drawing off purchasing power from individuals in taxes, in genuine loans and in other ways." He went on to speak of the ineffective efforts of the Government of India to control prices and said that you cannot control prices unless you prevent inflation. To which you must add rationing and possibly subsidies for food production as in this country. At the 1943 harvest there was an actual shortage of grain crops and there had also been an actual export of food grains from India which must be stopped.

The Secretary of State for India rose at once after Mr. Pethick-Lawrence sat down and said of his speech, "I do not think I differed from him on a single point" of his analysis of the situation. But, Mr. Amery added, the problem is one of even wider dimensions. Lord Woolton had warned us that we are running into a world shortage of food. Mr. Wallace, vice-president of the United States, had said that food will be the dominating problem of 1944. "The output" [of food], said the Secretary of State, "will not begin to meet the overwhelming demand for 1945, and the proper organisation to meet the coming world food crisis beforehand is a question of life and death for millions."

The most damaging criticism of the Government's attitude came from Sir George Schuster, who was formerly finance member of the Viceroy's Council in India and whose recent book on India is accepted as an objective and authoritative discussion of today's problems in that sub-continent. In general, Sir George agreed with Mr. Pethick-Lawrence and Mr. Amery as to diagnosis but stressed that on his reading of the matter "the two main contributory factors to the trouble have been, first, the meekness and vacillation of the Government of India, and secondly their total failure to devise and apply a sound financial policy." On the two crucial points in the story, how to handle food problems and financial policy, Mr. Amery and the India Office in London should have been able to give more advice and guidance to the Government of India, and "the responsibility which rests in London has not been fully discharged." This brought Sir George to the final stage in the ascending steps of responsibility, the House of Commons, for, as he pointed out, it is expressly laid down in the 1935 Act that it is Parliament "upon whom responsibility lies for the welfare and advancement of the Indian people." Sir John Anderson, now Chancellor of the Exchequer and a former governor of Bengal, replied to the debate (or rather buffered it) but said that he believed we had reached the peak of inflation—which may or may not be over optimistic.

But this Indian situation, grave in itself as affecting 390 millions of people, is only an example of conditions much more widespread in the world than our own guarded, ordered and controlled war-time lives. Outside Great Britain, the Dominions and the Colonies there are vast areas of inflation and food shortage. What the conditions will be in Europe when Hitler is finally defeated is difficult to prognosticate. What is certain is that hunger and disease will present governments, and especially the health ministries and the medical profession, with a greater task than any they have hitherto been asked to undertake.

QUESTION TIME

Domestic Staff for Hospitals

Mr. ERNEST BEVIN, Minister of Labour, in a statement made in the House of Commons on Nov. 4, said he had been giving careful consideration to the proper organisation and supply of domestic staff in time of war to institutions caring for the sick, the aged and infirm and young children, the school meals service, and similar organisations. He found that there was a lack in a great part of this field of any recognised rates of pay or conditions without which effective action on a large scale was extremely difficult. He therefore appointed at the end of July a committee, under the chairmanship of Sir Hector Hetherington, to advise him as to the rates of pay and other conditions of employment. The report of that committee had been received. He proposed to accept its recommendations on the clear understanding that the charges or deductions for meals should be a matter for arrangement between the employing body and the employees or their representatives, subject to the provision that the charges or deductions for full and adequate meals should in no case exceed those specified in the report and that working clothing, where required, would be regarded as a charge on the employing body. For the first time he would have a firm basis on which to work, and where these conditions were fulfilled he would deal with recruitment to this work in exactly the same way as to any other form of important national service, whether in industry or the Services, according to the priority allotted to it and including the use, as necessary, of his powers under Defence Regulations.

He did not propose to rest content with promulgating rates and conditions for adoption by individual institutions. It was his aim that this service should be placed in the general estimation on a footing with any other industry and that it should offer suitable training, prospects of advancement, and proper welfare arrangements. He was, therefore, appointing a small standing committee to advise him as to the further steps which should be taken from time to time in these and kindred matters, and so far as welfare was concerned, he intended to ask the Factory and Welfare Advisory Board to extend their scope and their membership to include welfare for domestic workers in institutions. He was also arranging that the welfare staff of his department, both at headquarters and in the regions, should include the welfare of these workers within their scope. Special courses of training for hospital cooks were already available, and he would seek the advice of the advisory committee as to the directions in which these could be extended. The further problem with which he was at present concerned related to the private household which was suffering undue hardship owing to sickness, childbirth, or other emergency. Plans for dealing with such cases were under consideration.

University Grants Committee

Mr. EDMUND HARVEY asked the Chancellor of the Exchequer how often the University Grants Committee had met during the last six months; and whether, in view of the urgency of the equipment of the universities to deal with the postwar situation, steps were being taken by the committee to formulate appropriate plans.—Sir J. ANDERSON replied: The reconstitution of the committee has been under consideration for some time and I hope shortly to announce the appointment to the committtee of a number of new members. Pending its reconstitution, meetings of the committee have not recently been held. The universities themselves have been studying the various problems which will face them after the war. The committee of vice-chancellors and principals have asked the University Grants Committee to undertake a review of these problems in order to form a considered estimate of the need for increased assistance from the Exchequer. This request will have to be considered as a matter of urgency by the reconstituted committee; meantime, the universities are being asked to formulate their postwar needs so far as they can be estimated in present circumstances.

Tuberculosis Allowances

Dr. E. SUMMERSKILL asked the Minister of Health whether he was satisfied that the allowances given to patients suffering from tuberculosis were adequate.—Mr. E. BROWN replied: The scales on which tuberculosis authorities are being reim-

bursed by the Exchequer in paying maintenance allowances to tuberculosis patients are in my opinion adequate for the purpose in view.—Dr. SUMMERSKILL: Is not the Minister aware that the object of these allowances was to relieve the anxiety of the patients and to encourage them to undergo treatment, and that in view of the fact that the amount of the allowances in some areas is little different from the public-assistance rate, this purpose is not achieved?—Mr. BROWN: The primary purpose is to make it easier for persons suffering from pulmonary tuberculosis to receive treatment without deterrent anxiety. I believe that there is a widespread welcome for this development.

Mr. F. MESSER: Is the Minister aware that in point of fact some of the categories in the memorandum are actually receiving less than the public-assistance scale?—Mr. BROWN: The memorandum gives full information on the whole subject.

Dr. SUMMERSKILL asked the Minister why he was granting allowances to patients suffering from acute tuberculosis and withholding them from chronic and incurable cases.—Mr. BROWN replied: I would refer to the reply given on Oct. 28. Dr. SUMMERSKILL: Is the Minister aware that the treatment of the tuberculous in this respect is the most inhuman that can be devised, because the patient who is refused an allowance knows therefore that he is incurable?—Mr. BROWN: I do not agree with that. The problem put to me was an industrial one. I asked the Medical Research Council to set up a committee, which they did, under Lord Dawson. I got their report, and allowances were settled for the first time and we got 100% grant from the Exchqeuer on a war basis. The larger problem falls to be considered with the whole question of dependants' allowances for sick persons.

Mr. H. MCNEIL asked the Secretary of State for Scotland how many applications from tuberculous patients for treatment or dependants' allowances had been refused since the inception of the scheme on the grounds that the applicants were not suffering from acute pulmonary tuberculosis or were unlikely to be fit for work within an ascertainable period.—Mr. T. JOHNSTON: Returns from all Scottish local authorities except two show that at Oct. 15, as compared with 1503 applications granted, 594 had been refused on the grounds stated in the question.

Miniature Radiography in Scotland

Miniature radiography sets have been allocated to the corporations of Glasgow and Edinburgh and to the county council of Lanark. The Glasgow set has been delivered and the corporation are now arranging for the appointment and training of the team which will operate it. Difficulties of supply are however delaying deliveries of the other sets. (Mr. Johnston replying to Mr. McNeil.)

Mass Radiography Apparatus for Russia

In reply to a question Mr. BROWN said: An offer recently made on behalf of the Government to present to the Soviet government two of the mass radiography units now being manufactured in this country has been accepted. They are to be sent to Russia almost immediately, and I learn from the Soviet Ambassador that one is to go to Stalingrad and the other to Leningrad. Though our present resources of these machines are limited, I feel certain that the people of this country will wholeheartedly approve the sending of two of them for the benefit of the heroic people of Leningrad and Stalingrad.

Staff Pay in Scottish Voluntary Hospitals

Mr. MCNEIL asked the Secretary of State for Scotland if all Scottish voluntary hospitals were paying their staffs the increased scales recommended by the Taylor Committee.—Mr. JOHNSTON replied: I am informed by the Scottish branch of the British Hospitals Association that 77 of the 120 voluntary hospitals in Scotland have decided to adopt the Taylor scales. Information with regard to the remaining 43 hospitals is not yet available.

Medical Treatment of Prisoners of War

Mr. R. W. SORENSEN asked the Secretary of State for War the number of prisoners of war, recently returned from Germany, who received surgical attention in Germany as the result of wounds received during the war; how many were fitted with artificial limbs by the German authorities; and whether he had received a Report respecting the general surgical and medical treatment our soldiers received.—Sir JAMES GRIGG replied: Very few of these men were fitted with artificial limbs by the German authorities. Most of them had reasonably effective appliances improvised in camp workshops. In general there were few complaints from the prisoners about medical treatment, much of which was, however, carried out by British medical personnel.

Paper Supply for Scientific Books

Mr. HARVEY asked the Minister of Production whether, in view of the need for an increase in the supply of paper for books and especially for books of an educational and scientific character, he had now been able to make a larger allotment of paper for this purpose.—Mr. O. LYTTELTON replied: I have authorised an increase of 2½% of prewar consumption in the allocation to each publisher, and an addition to the reserve to meet special needs. As in the case of newspapers and periodicals, I shall expect the publishers to give special attention to the needs of the Services.

Health Conditions in Freetown

Major A. M. LYONS asked the Secretary of State for the Colonies whether he had had an opportunity of personally inquiring into the responsibility for the deplorable conditions of health, lack of fresh water, bad drainage and housing at Freetown; and whether he could give the House an assurance that he was satisfied that improvement had been effected and would be sustained until these serious shortcomings had been completely rectified.—Colonel O. STANLEY replied: The present unsatisfactory conditions at Freetown are primarily due to the enormous strain suddenly thrown upon the administration of Sierra Leone by the exigencies of war and the consequent great increase in its population. I am satisfied that the administration is doing its best to improve conditions as quickly as possible, but its efforts are very seriously hampered by acute shortage of skilled personnel and of essential materials, adequate supplies of which cannot be expected to be available for a long time to come.

Major LYONS: Can the Minister say whether the administration which allowed this shocking state of affairs has been strengthened in any way?—Colonel STANLEY: I do not think that it is fair to blame the administration for whatever may have been the conditions at the beginning of the war. The then existing system had to work under the then income of the colony, and an administration which has had to work under those handicaps cannot be blamed for the result. Fortunately we have now altered that principle and in future the House will be able to help where a colony cannot do the requisite thing.

DOMESTIC SERVICE IN HOSPITALS

THE Government have adopted the recommendations of the Hetherington committee on the wages and working conditions of domestic staff in hospitals. "If hospitals and other institutions are to attract and retain domestic staffs of the quality which they require," say the committee, "every effort should be made to provide suitable conditions of accommodation and leisure." Some 10,000 more domestic workers are still needed in hospitals, and it is hoped that enough volunteers will now come forward to meet the shortage without recourse to the Minister of Labour's powers of direction.

For mental hospitals in England and Wales the committee adhere to the agreements made between the Mental Hospitals Association and the workers' union. For all other hospitals and institutions, voluntary or municipal, the minimum wage-scales for non-resident staff will range from 27*s.* 6*d.* a week for a maid of 15–16 years, to £3 5*s.* for cooks; for residents from £26 to £100 a year. Presumably a training in dietetics will carry a bonus. A 96-hour fortnight is recommended for all categories, with no extra pay for Sundays and bank holidays but time and a quarter for overtime. After 6 months service the domestic worker will be entitled to an annual week's holiday with pay, and in case of illness to 3 weeks' full and 3 weeks' half-pay in the first year, 6 weeks' full and 6 weeks' half-pay in the second year, and 9 weeks' full and 9 weeks' half-pay in subsequent years, NHI benefit being deducted from sick pay. Resident staff will be allowed an additional 12*s.* 6*d.* a week during holidays and sickness. The committee urge the need for efficient canteens for non-resident staff and suggest a scale of charges for meals. The wage-scales and conditions of service, which are fully set out in a white-paper (Cmd. 6481. HMSO. 2*d.*), must be complied with by all hospitals applying to the Ministry of Labour for domestic workers. Hospitals will welcome the Minister's promise, reported in our Parliamentary columns, to deal with recruitment to this work in exactly the same way as to any other form of important national service.

Letters to the Editor

OUTPATIENTS FIRST

SIR,—We are very glad to see in your leader of Oct. 30 reference to the need for improving the outpatient services at our large general hospitals. We warmly support your suggestion of a hostel and canteen for the use of the anxious relative, and for the outpatient who is undergoing X-ray or other treatment that does not necessitate the use of a fully nursed hospital bed. Considerable economy could, as you say, be effected. To the important reasons given in your leader pointing to the need for improvements, we would add the vital need in these days to avoid by every possible means the loss of working hours.

We regret, however, that separate outpatient blocks are postulated. Those who have studied this question carefully over a long period of years feel that quicker and more efficient investigation of the outpatient can be effected by close liaison with the medical, nursing and social welfare service available for the inpatient, than by completely divorcing the outpatient from the inpatient. We believe that the continuity in medical investigation, in nursing, and in social welfare which would be secured by a single service for the inpatient and the outpatient—who, after all, are generally the same person—is of paramount importance. The "separate block for outpatients" system which you advocate would perpetuate the condition existing in most hospitals today, whereby one group of doctors, nurses and almoners would deal with the outpatient, and another group with the inpatient.

In the hospital which we have the privilege to serve, the latest of the large voluntary hospitals built in this country, the following arrangements were deliberately planned to give a quick, full and efficient investigation to outpatients.

The hospital is vertically planned, with good lift service. The outpatients and inpatients, according to their disability, are accommodated on one floor. For instance, on the third floor of the hospital building, both medical outpatients and inpatients are dealt with. The lift and staircase lobby is the only dividing line between the in- and the outpatient. The floor possesses for these medical cases, whether in- or outpatient, its own almoner and clerks, its own clinical laboratory, its own cardiographic unit, and so on. The sister of the medical ward attends the outpatient clinics of her own physicians. She sees the man as an outpatient and knows all about him when subsequently he arrives in her ward as an inpatient. A fuller medical service is assured, inasmuch as at almost any hour during the day there is a physician, registrar, or house-physician available on that floor to see any outpatient who may, through urgency, come to the outpatient department on a day not appointed for the clinic.

The same arrangements apply to surgical patients, and with the specialist departments the advantages are even greater, inasmuch as the special equipment, special operating theatres, special instruments, &c., can be used for both inpatient and outpatient. Furthermore, the nursing staff experienced in eye work, or in any specialist branch of medicine, is available for both inpatient and outpatient.

One of us, having had 37 years' experience of hospital administration, would assure you that no economy in expenditure or staff would be secured by divorcing inpatients from outpatients. The maintenance of two blocks, for each of which a dispensing service, a nursing service and a kitchen service has to be provided, would, on the face of it, appear to add to cost. The suggestion that such outpatient block "would require only a comparatively small nursing staff to deal with tests and dressings," is misleading and unjustified.

We have put the result of much thought and careful planning to the test of experience at Westminster. We invite those interested to study the system at work, even in the adverse conditions obtaining after 4 years of war and a blitz.

In conclusion, we would sound a note of warning. The existence of a highly organised, efficient outpatient service will by no means reduce the demand upon beds, as implied in your article. The better the outpatient department, the greater the demand for beds. That is our experience.

E. ROCK CARLING
Consulting Surgeon.

Westminster Hospital, S.W.1. CHARLES M. POWER
House Governor and Secretary.

TONSILS AND ANTIBODIES

SIR,—Your leader shows a welcome spirit of tolerance for the pharyngeal lymphoid tissue. All tonsils except those of the newborn child contain living micro-organisms, picked up from food or air or both. Many of these organisms die, and to these the child is immune; others, to which he is not immune, live and produce toxins. From the tonsil these toxins pass to adjacent lymph nodes, and thence by efferent lymphatics to the tissues, evoking the formation of antibodies. The blood-stream carries the antibodies to the tonsil to destroy the organisms, the surplus antibodies remaining in the blood. The tonsil is therefore an inoculation organ through which immunity is built up and the child enabled to resist the infections current in the community in which he lives. Few children, if any, are born immune to all food or air-borne infections; most of them have to pass through many such infections before healthy adult life is reached. An attack recovered from may therefore be regarded as a stepping-stone towards increased immunity. The same duties are shared by the adenoid mass and the lymphoid follicles scattered about the mucous membranes of the body, including the Peyer's patches (which of course deal mainly with food-borne infections).

The crypts of the tonsil, however, form ideal breeding places for organisms, and though no such crypts are present in the adenoid mass it contains spaces between its folia in which organisms can lodge and multiply. Because of their size and structure the tonsils and adenoids are a more important section of what you have called the antibody factory than the smaller lymphoid follicles scattered about the mucous membranes. During childhood, then, they have important work to do which is interrupted by their removal; and unless they are harbouring an organism to which no further immunity is possible they should be left where they are.

Reasons usually given for removal of tonsils are: recurrent sore throats; and tonsillar sepsis or enlargement. If sore throats are an essential phase in the acquirement of immunity, removal for this reason cannot be justified. There are different degrees and forms of sepsis, but it is impossible to assess these by inspection. In the sense that they all carry micro-organisms all tonsils are septic; but the mere presence of organisms does not tell us that the production of antibodies has ceased. Large tonsils have been accused of hindering breathing and swallowing, but these are imaginary dangers. It is quite common to see a perfectly healthy child with very large tonsils, and mere bulk does not imply failure in performance.

Three main reasons given for the removal of adenoids are: mouth breathing; recurrent colds; and discharging ears. The adenoid mass, like the tonsils, enlarges when it is inflamed, and in that state might block the airway; but the condition is temporary, and the adenoid mass must rarely be large enough to obstruct breathing at other times. At operations on children for nasal obstruction it is not uncommon to find the adenoid mass quite small; such children, however, usually have a mucous or mucopurulent nasal discharge coming not from the adenoids but from the sinuses. In most of these cases transillumination shows an opaque sinus on one side or both. Sinusitis is accompanied by enlarged turbinals and these usually cause more obstruction when the child is lying down than when he is standing, so that the noise of obstructed breathing is more troublesome at night than in the daytime. Nasal obstruction in children, then, is often due to recurrent enlargement of the turbinals which may in turn be due to an infected ethmoid labyrinth. Small doses of potassium iodide (grains ¼–3, depending on the age of the child) stimulate the mucous glands of the nose and drain the sinuses by increasing secretion. Like recurrent sore throats, recurrent colds have their place in the process by which immunity is acquired; so that they do not indicate adenectomy. Removal

of adenoids is sometimes successful in reducing or stopping aural discharge in subacute or recurrent cases, many of which would have recovered in any case. In chronic cases it usually fails. Primary acute otitis, on the other hand, often follows removal of adenoids.

The main function of the tonsil and adenoid mass, then, is to pick up organisms from food or air or both, and to grow those to which an immunity is required. Until it is evident clinically that they contain an organism to which immunity is impossible, it would appear unwise to remove them.

Liverpool. P. W. LEATHART.

COUNTING LEUCOCYTES

SIR,—In view of the limited supply of standard pipettes for counting leucocytes, I have been encouraged to publish an alternative method, based on that of Strong for counting red cells, which has been found satisfactory.

3-inch Wassermann or Kahn tubes are fitted with corks (preferably rubber bungs), the latter being numbered in indelible pencil on the upper surface. From a clean 1 c.cm. graduated pipette 0·38 c.cm. of dilute (2%) acetic acid, suitably coloured, is accurately measured into each tube which is then stored upright. Blood is taken into a 20 c.mm. hæmoglobin pipette, blown into the acid and the pipette washed out. The cork is replaced and the tube, held in the right hand, is briefly shaken, with a circular movement, against the fingers of the left hand so that fluid does not reach the cork. The number of the tube is noted on the request form.

For the count, after similar but more thorough shaking, a sample of the dilution is transferred by means of a capillary (or hæmoglobin) pipette to a Neubauer counting chamber. The dilution is 1 in 20 and, if the cells in the four corner squares, each 1 sq. mm., are counted, the total is multiplied by 50.

If distilled water and acetone are carried, the pipette is readily cleaned and dried, and will serve for a round of blood-counts. It is much easier to get an even suspension in the tubes than in the bulb of the standard pipette, and safe transport of the specimens is simplified.

Claybury Emergency Hospital, Woodford Green. F. C. O. VALENTINE.

CONDITIONS OF MEDICAL SERVICE

SIR,—It was with great interest and still greater pleasure that I read in your issue of Oct. 30 the letter signed by 238 members of the British Medical Association. Not long ago, I, like others of the younger members, felt so disgusted at the policy of the BMA that I resigned membership. Working, as I was at that time, in a rather remote area, I was unable to attend the meetings of the local branch, as to do so would have meant nearly a day's absence from my practice. Only senior and well-established practitioners can afford to take risks of this kind, and unfortunately these same persons are not only very often reactionary in their outlook, but they have also quite definitely a vested interest at stake. These, on the whole, are the people who attend BMA meetings and their viewpoint is reflected in the decisions of the Annual Representative Meeting. The more enlightened minority has always been more or less inarticulate, and it is encouraging to see it coming to life at last. It is, I hope, after all the "little leaven" that "will leaven the whole lump." It has always seemed to me remarkable how little concerned a certain section of the profession appear to be with the welfare of the community, and how greatly concerned over the welfare of the doctor.

With the present shortage of doctors, which cannot be remedied all at once but which will persist for many years yet, surely the only way of meeting fairly the ever-increasing demand with a strictly limited supply is by organising a salaried medical service for the whole country. Before the war doctors, sad to say, often congregated where there was money and not where there was need.

The same issue of THE LANCET contains another letter in very different vein—that of Dr. Thomas Nelson. I must take exception to the suggestion that the present National Health Insurance capitation fee works out at sixpence per visit or consultation—I think that is what is inferred in the jibe about "state dope." On this assumption the practitioner earning £1100 a year from his panel would be seeing on the average 120 insured patients every day!

The chief objection to the panel system, or indeed to any competitive system, is that the more patients one has the less attention one can give them. Payment at "piece-work" rates does not necessarily improve matters as it may encourage either hurried imperfect work, or else unnecessary work. I have known a small local friendly society discontinue payment to doctors on a piece-work basis and substitute a capitation fee, simply because they discovered that a great many quite unnecessary visits were being paid. The medical profession, unfortunately, is no more honest than the rest of mankind.

Finally, does not a full-time salaried state medical service get rid once and for all of that dreadful anachronism whereby the young doctor must needs buy a practice before he can, with any hope of security, give his services to the community? Most of us have to borrow, and have consequently a millstone round our own (and our wives') necks for many years. Those lucky ones, who have been fortunately born, start in practice with no such handicap. Academic qualifications and practical experience should be all that are required in order that a man may serve the community to the full. It is high time a stop was put to the sentimental and mischievous nonsense talked about the alleged virtues of competition and the ennobling effects of struggle and self-denial.

Aberdeen. JOHN H. WILSON.

SIR,—The first happy days of a doctor's life are those spent at hospital as a senior student or as a resident. They are happy because his mental powers are devoted, without inhibition or ulterior motive, to the arts of clinical examination and the diagnosis and treatment of disease. Competition may be keen, not only between student and student but also between student and teaching staff; criticism is freely exchanged over successes and failures; but competition and criticism are always friendly.

Many members of my profession spent happy days in active service on land or at sea in the last Great War. They had little time to consider the pros and cons of a professional Service career; their only anxiety was to serve. Neither the Army nor the Navy is devoid of regulations, but it is certainly the rarest occurrence for either the enjoyment or the efficiency of a doctor's work in these Services to be hindered because he is a "slave of the state."

In general practice the doctor's environment is profoundly different. There is little or no friendly discussion with his colleagues in regard to his own patients; indeed he is too often justified in his fear lest one of his patients should be seen by a colleague. The failures of each doctor are pounced upon by another, his successes pass with praises unsung and are cynically attributed to a divine providence protecting the patient.

Diagnosis is often influenced by the patient's desire, which has to be considered, while the doctor's bread-and-butter depends on pleasing that patient. Not infrequently the diagnosis is determinedly made by the patient with the emphatic statement "I don't feel like work, I think I want a week's rest," after which statement clinical examination assumes a secondary importance and treatment is often not expected. Should clinical examination reveal no evidence of disease, the week's sickness would be granted rather than lose the patient or (what is more important) the bread-and-butter that he represents. It is difficult for the doctor to adopt a higher code of behaviour, for it is considered very proper to give the patient the benefit of the doubt.

Efficient examination is hindered at every turn by the expense of radiological or pathological investigations, often too expensive for the patient to bear, while the personal inconvenience and loss of time in obtaining such investigations at a voluntary hospital, under their present organisation, deters the patient from such a course. This is a criticism of the organisation of such hospitals, not of my colleagues who devote so much of their valuable time to their service.

Treatment sometimes has to be given when it is totally unnecessary, because the power of money gives

the private patient the right to demand such treatment, while the power of a state contract (which is completely one-sided) gives every insured patient an equal right. On the other hand, some treatments sadly necessary, such as physiotherapy for the most prevalent of all diseases in this country—namely, rheumatism—or psychotherapy for the ever-growing number of functional ailments, are often not instituted, either because the patient cannot afford unavoidably expensive private treatment or because he cannot get it at a hospital without all the vexations of passing through the preliminaries of the general outpatient department.

Some of us, though engaged in general medical practice, have had a good many years' experience of part-time service in the municipal hospital services, in which capacity, if no "slave of the state," one is at least the servant of a municipality. Here again a doctor can live and work in the atmosphere of work for work's sake. He is brought into intimate contact with the whole-time salaried medical officers of such hospital, the association being as delightful as the associations of student days. Indeed the atmosphere is in all respects similar, with a complete absence of money values, a complete absence of jealousy, inhibitions, and ulterior motives.

It is of course true that in these vast municipal services "free choice of doctor" is as meaningless as it is for the 18 million or more of the population who rely so largely upon the voluntary hospitals for the diagnosis and treatment of most diseases other than mild ailments. In neither case does the patient, recommended to a hospital, ever make his attendance depend upon this choice of a particular member of the hospital's staff.

At its worst, could a whole-time state medical service be anything but a vast improvement on private medical practice at its best? I do not seek publicity and therefore must sign myself

A GENERAL PRACTITIONER.

DIPHTHERIA IN IMMUNISED CHILDREN

SIR,—In your issue of Oct. 16 (p. 490) you refer to the high incidence of diphtheria in immunised children in Dublin; and you state, apparently by way of explanation, ". . . but it should be noted that 35% or more of the children immunised in Dublin are estimated to have received only a single dose of alum precipitated toxoid."

A short time ago I made a detailed study of diphtheria statistics in Dublin, the results of which were in part published (*Irish J. med. Sci.* April–May, 1943). During the years 1935, 1936 and 1937 children received one injection of APT. Before that time they received three injections of TAF or TAM, and since then two injections of APT, each of 0·5 c.cm. Up to the end of 1942, 35·1% of the children immunised had received only one injection of prophylactic. The extent to which children immunised in 1934, when they received three injections of TAF, subsequently contracted diphtheria may be compared with the extent to which those immunised in 1935 and 1936 with one injection of APT contracted the disease. Of 9383 children immunised in 1934 with TAF, 78 had contracted the disease up to the end of 1942, giving an attack-rate of 8·4 per thousand. Of 30,180 receiving one injection of APT in 1935, 219 had contracted the disease up to the end of 1942, and of 11,193 receiving one injection of APT in 1936, 109 had contracted diphtheria by the end of 1942, giving attack-rates of 7·3 and 9·8 per thousand respectively. These figures do not suggest any difference between the protective effect of one injection of APT and that of three injections of TAF.

I have shown in my paper that there may be no difference between the protective effect of two injections of APT and that of one injection. This has been shown by comparing the attack-rates in those immunised by the two methods for the year of inoculation and two subsequent years, allowing a period of three months after immunisation to elapse before counting the cases, taking into consideration also the age-distribution of the immunised and fluctuations in the virulence of the disease. Thus the fact that so many received only one injection of prophylactic does not in itself explain the high incidence of diphtheria in immunised children. Notwithstanding the high proportion of children (75% of the child population at the end of 1941) who have received immunising injections, the returns for the present year show a higher incidence of diphtheria in Dublin than ever before. While evidence in favour of any influence of the present prophylactics on the incidence of diphtheria in Dublin is open to question, it does appear that the risk of a fatal issue is less in those who have been inoculated than in those who have not.

School of Pathology, Trinity College, Dublin. J. C. GAFFNEY.

STERILITY AND IMPAIRED FERTILITY

SIR,—The statement under this heading in your issue of Oct. 9 (p. 457) directs attention to the frequency of (physiological) sterility and to the need for an extension of facilities for its further investigation and treatment. With this part of the letter of your sixteen correspondents we are in agreement.

We do not, however, agree that "consideration of all available data strongly suggests that the barren and the very small family reflect lower fecundity rather than excessive unwillingness to reproduce." We believe that a definite pronouncement on these questions cannot be made until much more evidence becomes available. For example, we require to know the fertility trends in the major social groupings and the variation in the size of families according to social and economic levels, by date of and age at marriage. These are data which can only be ascertained by census inquiries. Meanwhile, there is much evidence that a major influence in the creation of the modern small family is voluntary restriction of fertility and that this has had its origin in changed social and ecomomic standards. Thus, so long as there is no adequate evidence of a difference in the *innate* fertility of different groupings it would seem to be safe to assume, for example, that the small families of the professional classes are due to voluntary restriction.

From the demographic standpoint, the central question at the present time is whether infecundity has *increased* in such a way as to play a part in the decline in fertility. At present there is no evidence to show that such an increase has played any part at all. There is no reason for thinking that fertility is any more affected by this cause now than it was 70 years ago, when the birth-rate was over 30 per thousand. In the effort to raise fertility, undoubtedly everything should be done to help parents who are involuntarily sterile; but the main object of policy must remain that of changing the social and economic conditions and the attitudes of normally fecund parents so as to favour the large rather than the small family.

A. M. CARR-SAUNDERS. R. M. TITMUSS.
D. V. GLASS. JAMES YOUNG.
EARDLEY HOLLAND. C. P. BLACKER.
HORDER,

Population Investigation Committee, 69, Eccleston Square, London, S.W.1.

A CHIEF'S FORESIGHT

SIR,—Your peripatetic correspondent is not quite correct in his reference to the Kikuyu: the Kikuyu are essentially agricultural. It was the Masai who sold their precious cattle to Liebig's to get the money to pay for M & B 693 to cure their gonorrhœa. The credit for this transaction is undoubtedly due to the patience and persuasive powers of the medical officer who taught the chiefs that the sterility of their women was largely caused by Neisser's organism and could be cured by drugs.

Devoran, Cornwall. JAMES H. SEQUEIRA.

MEDICAL MAN-POWER.—The Minister of Health in circular 2881 has passed on to hospital authorities the recommendation of the Medical Personnel (Priority) Committee that for the present the war-time establishment of hospitals shall not be increased and that no posts shall be upgraded. The post of medical superintendent is not covered by the recommendation but in considering applications from local authorities for permission to create these posts the Minister will feel bound to have regard for the committee's suggestion.

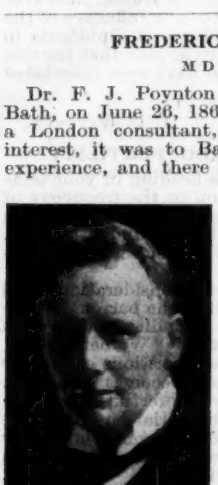
Last May the Minister informed public-health medical officers of military age that they must obtain his permission before applying for a new post. This procedure has now been extended to women medical officers holding whole-time public-health appointments who are over military age, but who were born after March 5, 1896.

Obituary

FREDERIC JOHN POYNTON

M D LOND., F R C P

Dr. F. J. Poynton was born at Kelston Rectory, Bath, on June 26, 1869, and after an absorbing life as a London consultant, with rheumatism as his main interest, it was to Bath he retired to excogitate his experience, and there after surviving the blitz he died of a heart attack on Oct. 29.



Press Portrait Bureau

He was educated at Marlborough and University College, Bristol, entered St. Mary's Hospital with a scholarship and qualified in 1893. Seven years later he was appointed to the staff of Great Ormond Street, to follow in the steps of his master, Cheadle, and after another three years he became assistant physician to University College Hospital, with charge of the children's ward. During this time he was being tested as a clinician and teacher, revealing the eagerness to benefit medicine and the vivid approach to the child's personality which assured his professional career, combined with the honesty of purpose and the mischievous frankness of speech that endeared him to students. All this time he was publishing a steady stream of work on rheumatism in relation to the heart, in association now with David Lees on cardiac dilatation and again with Broadbent on changes in the myocardium. The year 1913 was the climax, for it was then that he collected in one volume the outcome of fifteen years of research with Alexander Paine, upholding the view that acute rheumatism is to be looked on as the result of infection by a diplococcus of the streptococcal group. They did not maintain that this invasion was the whole explanation, but the presence of the organism in the tissues was an essential factor in the disease. At the international congress of medicine, held that year in London, he also asserted that Paine's diplococcus, injected intravenously into rabbits, would produce any and every form of chronic arthritis. The controversy over these observations, at one time acute, has mellowed without dying away completely, as our correspondence columns showed in June of last year, when the old war-horse lamented that all his specimens had been destroyed by enemy action: "a loss, I think, to English medicine"—with which many will agree. That streptococci play an important contributory part in the ætiology of acute rheumatism is now generally regarded as being true.

At the College of Physicians he was Bradshaw lecturer in 1924, holding office up to senior censorship in 1930 and after that meeting his colleagues regularly at the College Club. He was at his best there and as chairman of committees, for which he always made himself master of the subject in hand. His Lettsomian, Harben and Long Fox lectures were all full of meat. In 1931 he was president of the British Pædiatric Association. Outside London his work took him to the heart hospitals at West Wickham and Lancing, and the orthopædic hospital at Winford. He also advised the National Children Adoption Association.

Of the man himself H. L. T. has sent us the following sketch. "Poynton," he writes, "was a character and sometimes appeared almost wishful to be an oddity. He was a countryman, and deliberately retained a countryman's characteristics with a certain scorn of personal appearance. Short and stocky in build, he was enormously strong. He held the curious record of captaining a first-class county cricket eleven after attaining to the sober dignity of a fellow of the College of Physicians. His outstanding cricketing feat was achieved in two hours at Hove when he and Sammy Woods scored 305 runs at top speed for Somerset against Sussex, and he loved to recall the episode. In his cricketing days, he was always known as Joseph, and in the pavilion at Lord's during the big matches he would be affectionately greeted by many old friends. He played hockey for Middlesex and had some skill at real tennis. He had a fine tenor voice and sang for many years in the choir of St. James's Church. Unfortunately he allowed his professional life to be clouded by what he considered to be the unsympathetic attitude of the profession towards his researches on rheumatic fever, though his resentment never extended to individuals. When speaking in public and at medical meetings he seemed to delight in supporting some illogical standpoint, and while he amused his audience he was not taken very seriously. But when he dealt with a sick child he had a knack of talking spontaneously as if they were equals and every child felt at ease with him. He was a delightful personal friend and a great companion on a holiday. He enjoyed every moment, even when missing a critical short putt and backing his car by mistake on an outraged goat, which instantly attacked him. Life was not too kind to him and some blows left their mark, but to the end he retained his power of boyish enjoyment, his sincerity and his honesty and his love of children."

WILFRID BURTON WOOD

M D CAMB., F R C P, D P H

Dr. Burton Wood, who died at Panfield, Essex, on Nov. 3, just short of his 60th birthday, was a physician-scholar whose place will be hard to fill. Born at Southport, the second son of Peter F. Wood of Chislehurst, he was educated at the Leys School and Jesus College, Cambridge, where he took his MA in 1908, and qualified two years later from St. Bartholomew's Hospital. He then filled a series of house appointments before war broke out in 1914 and he joined the RAMC. He was with a landing party in Gallipoli, was transferred to Mesopotamia, and later to the North-West Frontier Force, where he was mentioned in dispatches. After the war he settled at Grays, where he became assistant MOH to Essex county, but soon returned to clinical medicine as physician to the London Chest Hospital and consultant for diseases of the chest to the Essex council. He did pioneer work on pulmonary asbestosis when it appeared in the twenties and became an authority on pulmonary tubercle in children. With F. G. Chandler he worked and wrote on the use of iodised oil in the diagnosis of thoracic disease, and was unremitting in his search for the relief of bronchiectasis. He had an extensive knowledge of English literature, wrote fluently and with a sure touch, and was a brilliant speaker. He was also no mean artist, and his accurate perception of line and contour made him an expert in the reading of the radiogram. Extensive travel had awakened his interest in post-graduate study, and overseas students especially owed much to his wise tutelage. He had long been subject to coronary disease which limited his freedom of movement but did not subdue his strenuous and active temperament, and in his remote country cottage he read much and wrote long letters. He is survived by his widow, a daughter of John Boston of Birkdale, and their three children.

Burton Wood, writes S. R. G., came into his own very late. The end of the last war found him on the North-West Frontier and he was a long time getting back to work and finding his real niche in the medical world. When he did, it was characteristic of him that he spared neither time nor labour, taking infinite pains with everything like the true artist that he was. His public speaking was remarkable. I have seen him get up in a meeting which had become utterly bored with dull speeches and galvanise it into alertness with his humour and apt quotation. At the hospital luncheon table he had a Chestertonian wit which spared none of his colleagues, but we laughed at his gaiety and never took it amiss. And somehow into the rush of modern life he brought an eighteenth-century spaciousness. Chest physicians have a curious habit of making diagrams. Wood never did that. His pictures were always three-dimensional and well proportioned. And so, too, was his outlook. The day after the hospital had been half destroyed by a bomb and my own department had been blown to pieces I received from him a copy of Lord David Cecil's essay on the English poets with the inscription on the fly-leaf "The City of God remaineth."

JACK ARTHUR WAIN

M B WITWATERSRAND, F R C S E, D M R

Dr. J. A. Wain died on Oct. 25 in Manchester at the Christie Hospital, where he was one of the radiotherapists at the Holt Radium Institute. He was born and educated in South Africa, graduating MB, at the University of Witwatersrand, in 1929. After holding house-appointments at the Johannesburg General Hospital, he became resident medical officer at the Settlers Hospital, Grahamstown, for four years. Two years in general practice in the Cape Province followed, and in 1937 he came to this country and took the FRCSE a year later. Wain became interested in recent developments in radiotherapy and visited the Holt Radium Institute, where he found the work appealed to him so much that he decided to make it his specialty. He was appointed to the staff, where he remained, except for nine months in Edinburgh to take the DMR, until his death. As a senior member of the Institute staff, he had charge of special clinics at the Manchester Skin Hospital, the Blackpool Victoria Hospital, the Royal Lancaster infirmary, and the Wigan Infirmary. When war broke out his wife and baby girl returned to their home in South Africa, but Dr. Wain chose to remain with his Manchester friends and patients. He was 38 years of age.

Dr. HERMANN GUNTHER died on Oct. 28, at the house in Hampton Wick from which the family practice had been run since it was started by his father, Theodore Gunther, in 1863. Hermann was born there in 1872, but during his early schooldays he shared the congenial home of his uncle, Albert Gunther, FRS, at the British Museum. He attended University College School with his cousin R. T. Gunther, later to become curator of the Museum for the History of Science at Oxford. Against this background Hermann's taste for natural history and archæology developed and when, after qualifying from University College Hospital in 1896, he joined his father in practice he spent his leisure in learning all about his own district. He was a distinguished member of the Surrey Archæological Society, and his fellow members of the Japan Society often admired his collection of netsukes, the carved buttons worn by the Japanese at the end of their girdle cords. Gunther was also interested in the history of railways, especially the old L & SWR.

Births, Marriages and Deaths

BIRTHS

ALMOND.—On Nov. 2, in London, the wife of Surgeon Lieutenant R. G. P. Almond, RNVR—a son.

CAREY.—On Nov. 3, at Skegness, Lincs, the wife of Surgeon Lieut.-Commander Fraser Carey, RNVR—a daughter.

DESMOND.—On Oct. 11, in Bermuda, the wife of Surgeon Lieut.-Commander A. M. Desmond, FRCS, RNVR—a son.

DIXON.—On Nov. 3, in London, the wife of Wing-Commander F. W. P. Dixon, FRCS, RAF—a son.

MCENTEE.—On Nov. 6, at Cheam, the wife of Dr. J. C. McEntee—a daughter.

MELECK.—On Oct. 22, at Limpsfield, Surrey, the wife of Surgeon Lieutenant Simon Meleck, RNVR—a daughter.

ROCHE.—On Nov. 5, at Beaconsfield, the wife of Mr. A. E. Roche, FRCS—a son.

ROOKE.—On Nov. 5, at Hove, Sussex, the wife of Surgeon Lieutenant C. J. Rooke, RNVR—a daughter.

MARRIAGES

BARNSLEY—COOK.—On Oct. 30, at Storrington, Alan Gabriel Barnsley, lieutenant RAMC, to Edwina Eleanora Cook.

LEWIS—BENTHAM.—On Nov. 6, at Poynton, John Tudor Lewis, MD, to Cicely Bentham.

DEATHS

CLAPHAM.—On Nov. 6, Edward William Clapham, MRCS, of Britford, Salisbury, consulting anæsthetist to the London Hospital.

CRONK.—On Nov. 4, Herbert George Cronk, MB CAMB., aged 89.

DANIEL.—On Nov. 3, at Epsom, Edgar George Clement Daniel, MB CAMB., aged 74.

FENTON.—On Nov. 5, at Ilford, Charles Francis Fenton, MRCS.

GALBRAITH.—On Nov. 2, at Tonbridge, Samuel Nicol Galbraith, MB GLASG., DPH, late MOH for South West Kent, aged 59.

GOSTLING.—On Nov. 3, at York, George Wilfrid Gostling, MB LOND., aged 73.

GRANT-WILSON.—On Nov. 1, at Sidmouth, Charles Westbrooke Grant-Wilson, MRCS, aged 74.

HORGAN.—On Sept. 10, at Lisbon, David St. Helier Horgan, MB RUI, DO, late surgeon RN.

HORNE.—On Oct. 31, at Strathpeffer, John Howard Horne, MB EDIN., major IMS, retd.

JOHNSTON.—On Nov. 1, at Petersfield, George Johnston, MD EDIN., MRCP.

LAFFAN.—On Oct. 29, in Torquay, Richard Charles Kirby Laffan, LRCSI & E, lieut.-colonel RAMC retd.

LEVIS.—On Nov. 5, at Bath, John Samuel Levis, MB NUI.

WOOD.—On Nov. 3, at Shalford Green, Essex, Wilfrid Burton Wood, MD CAMB., FRCP, DPH.

Notes and News

PROSPECTS IN MEDICAL EDUCATION

CONVOCATION of the University of London has adopted two resolutions which bear on the future of medical teaching to men and women. Of the 12 schools of the university providing clinical experience, one admits only women, two admit a limited quota of women, and the remainder do not accept women students. The West London Hospital, which gives preference to women, is not yet a university school. Convocation passed the following communication to the Court and Senate:

> "It is an essential part of the tradition and the public policy of the University that a woman seeking university education in London should not be placed at a disadvantage on the ground of her sex. In the opinion of Convocation it is essential that prompt measures should be taken to give effect to this policy in the Faculty of Medicine by the provision of greater facilities for the medical education of women."

Attention was also directed to the great opportunities for medical teaching available in the London County Council general, special and mental hospitals, the provisions made there for research and pathological work, the domiciliary and midwifery services of the council, and the school medical services. Convocation, impressed by these opportunities for the development and enrichment of medical education in London, urged the Court and Senate to explore them in consultation with the council, with a view to the closest possible coöperation.

IN MEMORY OF PRINCESS TSAHAI

Dr. Margaret Balfour, Lord Davies, Mr. Somerville Hastings, FRCS, Lord Horder, FRCP, Sir Philip Manson-Bahr, FRCP, and Miss E. Sylvia Pankhurst have signed an appeal issued by the fund for gifts to help in establishing a hospital in Ethiopia in memory of Princess Tsahai, daughter of the Emperor Haile Selassie. She trained as a nurse in this country and died at the age of 22 soon after her father's restoration to his throne. The Emperor has given a partially constructed hospital on the outskirts of Addis Ababa, near the hot springs. The first unit will accommodate 100 beds, and will comprise administrative offices, a general hospital, and a children's section. There are at present no separate wards for sick children in Ethiopia. The treatment and study of tropical diseases should occupy a major share in the activities of the hospital, and it is also hoped to provide a medical and nursing school. The Memorial Hospital council is sending immediately £3000 to roof the partially built hospital; £22,000 will be needed to complete the structure, and a further sum to equip and endow the hospital. The target is £100,000. All inquiries should be sent to the hon. secretary, 3, Charteris Road, Woodford Green, Essex, and donations to Lord Horder, c/o Messrs. H. Reynolds & Co., 9, Greenhalgh Walk, London, N.2.

EGHAM REHABILITATION CENTRE

THE Ministry of Labour has established a residential centre at Wood Lee, near Egham, Surrey, for men who, after an accident or illness, need reconditioning to make them fit to resume their usual occupation or to take a course of training for another one. The centre is intended for men between 18 and 50 who have passed the convalescent stage; admission is at present restricted to 100 men who have been discharged within a year from one of the Services or from a hospital in Civil Defence Regions Nos. 4–6 and 12, but accommodation is being extended. The courses will last 6–8 weeks and will be supervised by a medical officer, but medical treatment and nursing are not provided. Board and lodging and travelling expenses will be provided by the Ministry, and a man will receive a weekly allowance of from 9*s.* to 24*s.* a week, according to age, with extra payments for wife and children and upkeep of his home.

ESCAPISM IN SMITHFIELD

St. Bartholomew's Hospital has seen the paintings, drawings and sculpture of its staff in the first art exhibition held there since the beginning of the war. From a huge war poster by the exhibition's secretary to the charming miniatures of one of the nurses the variety was great; from the competent paintings of Sir Harold Gillies to the work of one of the porters all the talent in the hospital was well represented. Gillies chose a subject near to home in "Wet Sunday in Marylebone," the best of his contributions. The physicians inclined to more delicate expression in water-colour, and Dr. Geoffrey Bourne showed himself no mean artist with a

Sussex landscape and an impression of Chiswick Reach painted with a subtle mistiness almost reminiscent of the physician's art. Dr. Hinds Howell contributed a strong, delightful woodland landscape. Among the other water-colours one by a student was outstanding; an oak tree by an English lane in the soft light of an October morning was the subject, and the impression was satisfying. This escapism—this deliberate turning to lighter thoughts and lighter subjects—was the keynote of the show, with the dismal exceptions provided by the secretary, who introduced a skyline of shattered masonry with morbid persistence. Expressive figures in plaster, wood and ivory by Miss Beth Jukes, were the work of a capable artist, and Mr. Brian Brooke had chiselled two heads in stone during his spare time from surgery.

There was creditable evidence of fresh ideas struggling for expression, and though the successful paintings stood out like good deeds in a slightly imperfect world the indications were that medicine and culture still go hand in hand.

University of Cambridge

On Oct. 30 the degrees of MB, B CHIR were conferred by proxy on J. W. Fawcett.

Royal College of Surgeons of England

The annual meeting of fellows and members will be held at the College, Lincoln's Inn Fields, London, W.C.2, on Thursday, Nov. 18, at 2.30 PM.

Royal College of Physicians of Ireland

At a meeting of the college on Oct. 18, Dr. W. G. Harvey was elected president. Dr. Harvey was, till he retired last year, one of the physicians to the Adelaide Hospital, Dublin. He has been a fellow of the college since 1908.

Royal College of Physicians of Edinburgh

At a meeting of the college held on Nov. 2, with Dr. Charles McNeil, the president, in the chair, Dr. Ian Murray (Glasgow) and Dr. Harry Stalker (Edinburgh) were introduced and took their seats as fellows. The Hill Pattison-Struthers bursaries in anatomy and physiology, and clinical medicine were awarded to W. R. Brown and P. D. Kemp respectively.

Royal Society

The Copley medal has been awarded to Sir Joseph Barcroft, FRS, for his work on respiration and the respiratory function of the blood, and the Davy medal to Prof. I. M. Heilbron, D SC, FRS, for his contributions to organic chemistry, especially to the chemistry of natural products of physiological importance.

Royal Society of Medicine

At a joint meeting of the sections of physical medicine and disease in children on Wednesday, Nov. 17, at 4 PM there will be a discussion on anterior poliomyelitis. The opening speakers are to be Major William Stewart, USAMC, Dr. Queenie May and Mr. Eric Lloyd. On Nov. 18, at 2.30 PM, Brigadier Hugh Cairns will deliver his presidential address to the section of neurology. He will speak on gunshot wounds in the head and afterwards there will be a discussion. Cases will be shown at the meeting of the section of dermatology at 4 PM on the same day. On Nov. 19, at 4 PM, Dr. Albert Sharman will read a paper to the section of obstetrics and gynæcology on some recent studies and investigations in sterility. On the same day at 4.45 PM the section of radiology will meet to discuss the organisation of a fluoroscopic service for the civilian community. The openers are to be Dr. Maurice Davidson, Major Peter Kerley, Dr. P. D'Arcy Hart and Wing-Commander R. R. Trail.

Campaign against Colds

For the third winter in succession the Ministry of Health, in coöperation with the Ministry of Information, is launching a campaign to reduce the spread of colds, influenza and other droplet infections. The public will again be urged to "help to keep the nation fighting fit" by avoiding careless coughing and sneezing. Posters, vehicle bills, window displays and films will be used. As before, copies in 35 mm. sound and 16 mm. sound of "Breath of Danger" (9 minutes), and of "The Nose Has It" (5 minutes) may be borrowed from the Central Film Library, Imperial Institute, Kensington, London, S.W.7. "Breath of Danger" may also be borrowed from the Central Council for Health Education, Tavistock House, Tavistock Square, W.C.1, which made it. The council also offers health leaflets and posters for sale to local authorities.

Eugenics Society

On Tuesday, Nov. 16, at 5 PM, at the rooms of the Royal Society, Burlington House, Piccadilly, W.1, Mr. R. M. Titmuss will speak on social environment and eugenics.

Paddington Medical Society

On Tuesday, Nov. 16, at 8.45 PM, at St. Mary's Hospital, Paddington, W.2, Mr. A. Dickson Wright will lecture on recent advances in surgery.

Royal Society of Tropical Medicine and Hygiene

A meeting will be held at 26, Portland Place, London, W.1, on Thursday, Nov. 18, at 3 PM, when Lieut.-Colonel Ernest Bulmer will read a paper on tropical diseases in soldiers in the Middle East.

Thoracic Surgery at Preston Hall Sanatorium

Major thoracic surgery has been discontinued at Preston Hall, Maidstone, since Laurence O'Shaughnessy was killed in France in 1940. It is now hoped to use Preston Hall as a centre for the surgical treatment of patients from all three institutions now under the British Legion, the others being Nayland Sanatorium near Colchester, and Douglas House, Bournemouth. Surgeon Commander G. A. Mason has been appointed thoracic surgeon to the British Legion Village from Nov. 1.

Faculty of Radiologists

The diagnosis section will meet at 32, Welbeck Street, London, W.1, on Saturday, Nov. 20, at 10.30 AM, when Captain P. P. Hauch, RCAMC, will speak on pneumoroentgenography of the knee-joint, Dr. E. Rohan Williams on venous intravasation during utero-salpingography, and Dr. John Wilkie on a case of Albright's disease.

Bernhard Baron Grants

The Charities Fund have made a grant of £30,000 to Queen Charlotte's Hospital to provide more accommodation for maternity cases. The grant is conditional on a section of the partly built nurses' home being completed by the end of next year. The fund has also granted £10,000 to the British Empire Cancer Campaign and £5000 to the Robert Jones and Agnes Hunt Orthopædic Hospital.

London Association of Medical Women's Federation

At a meeting to be held at BMA House, Tavistock Square, London, W.C.1, on Saturday, Nov. 20, at 3 PM, Dr. Ian Skottowe will discuss some current methods of treatment in psychological medicine.

Medical Casualties

The following casualties among RAMC officers have been announced:

Wounded.—Captain E. M. Leyland, MB EDIN., Captain F. M. Steel, MB GLASG., and Captain J. R. Tocher, MB ABERD.

Prisoner of War.—Major K. C. Hutchin, MB GLASG.

THE makers of Insulin A.B. and Insulin 'Wellcome' brand announce that, following the adoption of improved production methods, the prices of these products will be reduced on Jan. 1, 1944, to correspond with those now in force for H-A-B Insulin and Insulin Hospital Packing (BWCo). In consequence the issue of hospital packings will cease on that date and the makers will supply Insulin A.B. or Insulin 'Wellcome' brand whenever insulin is ordered.

THE epidemic of poliomyelitis in Malta described by Prof. H. J. Seddon (*Lancet*, Oct. 30, p. 549) occurred between November, 1942, and March, 1943.

Appointments

CLYNE, D. G. Wilson, BM OXFD, MRCOG: temp. gynæcologist to the Hampstead General and North-West London Hospital.

NEWELL, A. G., MD GLASG., DPH: temp. MOH, school MO for Blyth and MO to the River Blyth port health authority.

NORRIS, D. C., MD LOND., FRCS: part-time surgical registrar to the outpatient department at the Royal National Orthopædic Hospital, London.

PARRY-EDWARDS, O. J., MB DUBL.: asst MOH and school MO for Anglesey and medical superintendent of Valley Emergency Hospital.

SAMES, C. P., MB LOND., FRCS: part-time surgical registrar to the outpatient department at the Royal National Orthopædic Hospital, London.

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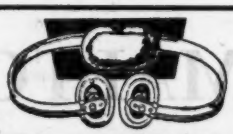

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Notice is hereby given that the following Examinations will commence on the dates stated below:—

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(Chemistry, Physics, and Biology)
MONDAY, 6TH DECEMBER.

FIRST EXAMINATION
(Anatomy, Physiology, and Pharmacology)
MONDAY, 13TH DECEMBER.

FINAL EXAMINATION
(Pathology, Medicine, Surgery, and Midwifery)
MONDAY, 3RD JANUARY.

Candidates who have fulfilled the necessary conditions and who desire to present themselves for examination must give notice in writing to the Secretary, Examination Hall, 8–11, Queen-square, London, W.C.1, at least twenty-one days before the date of the Examination, transmitting at the same time such certificates as may be required by the regulations of the Board, together with the full amount of the fee due for the subject or subjects for which they desire to enter.

HORACE H. REW, Secretary.

Royal College of Surgeons of England.

The Council invites applications for the Four EXAMINERSHIPS in APPLIED PHYSIOLOGY AND PATHOLOGY under the new regulations for the Primary Fellowship Examination. The Examinations will be held in April and October, beginning April, 1944. Copies of the synopsis of the subjects may be obtained from the Secretary.

Candidates must be persons holding a medical qualification registrable in this country.

Applications, in writing, must be made to the Secretary on or before Tuesday, 30th November, 1943.

KENNEDY CASSELS, Secretary.

Lincoln's Inn-fields, W.C.2, 13th November, 1943.

Royal College of Physicians of London.

The next ordinary PROFESSIONAL EXAMINATION for the MEMBERSHIP will commence on WEDNESDAY, 5TH JANUARY, 1944.

Candidates are required to give twenty-one days' notice in writing to the Registrar of the College, to whom all certificates and testimonials required by the bye-laws must be sent at the same time.

Candidates who propose to submit published work under the regulations now in force are required to give twenty-eight days' notice, and should apply in writing to the Registrar, without delay, for detailed instructions as to the procedure they should follow.

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The lectures, which are on the Anatomy and Physiology of the Nervous System, and on Psychology and all aspects of Psychiatry and Mental Deficiency, will be held in short monthly courses on three afternoons a week at the Maudsley Hospital, Denmark Hill, S.E.5.

Clinical Instruction in Psychiatry and Neurology to comply with the regulations of the Examining Bodies will be arranged if required.

Inquiries should be addressed to Dr. W. W. KAY, Acting Honorary Director of the Maudsley Hospital Medical School, The Central Pathological Laboratory, at West Park Hospital, Epsom, Surrey (Telephone No.: Epsom 1408).

The last day for enrolment is 30th November, 1943.

Royal College of Physicians of London.

Dr. L. G. PARSONS, F.R.C.P., will deliver the First CHARLES WEST LECTURE on TUESDAY, 16TH NOVEMBER, at 2.15 P.M., at the College, Pall Mall East, S.W.1.

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H. M. BARLOW, Secretary.

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Telephone: 3216 & 3217

A Private Hospital for the Care and Treatment of those of both sexes suffering from MENTAL DISORDERS

Extensive grounds. Detached Villas. Chapel. Garden Produce from own gardens. Terms very moderate.

CONVALESCENT HOME AT BOURNEMOUTH

standing in 12 acres of ornamental grounds, with separate villas, tennis courts, etc. Patients or Boarders may visit the Home by arrangement.

Illustrated Brochure on application to the Medical Superintendent, The Old Manor, Salisbury.

PECKHAM HOUSE, 112, Peckham Road, London, S.E.15

Telegrams: "Alleviated, London" **Telephone: Rodney 2641-2642**

A Private Mental Hospital, for Ladies and Gentlemen suffering from Nervous and Mental Illness, where the amenities of a comfortable home are combined with full investigation and every well-established modern treatment.

Terms from 3½ guineas weekly.

Illustrated Prospectus may be obtained from the Physician Superintendent.

COURT HALL, KENTON, near EXETER

FOR THE TREATMENT OF EIGHT LADIES, VOLUNTARY, TEMPORARY AND CERTIFIED PATIENTS

CLIFFDEN, TEIGNMOUTH

FOR EARLY AND CONVALESCENT CASES Recreational Therapies are held daily by skilled Leaders

The house stands high with spacious balconies and extensive views of the South Devon Coast. Beautiful garden. Own Dairy in 25 acres. Private road to beach

There is also a charming house, **EBWORTHY, MANATON, DARTMOOR**, situated in 20 acres, 1100 ft. up for bracing moorland air

Resident Physicians—BERTHA M. MULES, M.D., B.S. ANNE S. MULES, M.R.C.S., L.R.C.P. *Telephones*—STARCROSS 259 and TEIGNMOUTH 289

TOR-NA-DEE SANATORIUM

Managing Director: DAVID LAWSON, M.D., F.R.S.E.

FOR THE TREATMENT OF PULMONARY TUBERCULOSIS AND ALLIED DISEASES

Medical Superintendent: R. Y. KEERS, M.D. (Edin.)

For prospectus apply to The Secretary, Tor-na-Dee, Murtle, Aberdeenshire Telephone: Cults 107

CHEADLE ROYAL CHEADLE CHESHIRE

A Registered Hospital for MENTAL DISEASES, and its Seaside Branch, GLAN-Y-DON, Colwyn Bay, N. Wales

THE object of this Hospital is to provide the most efficient means for the treatment and care of PATIENTS of BOTH SEXES suffering from MENTAL and NERVOUS DISEASES. The Hospital is governed by a Committee appointed by the Trustees of the Manchester Royal Infirmary. VOLUNTARY, TEMPORARY, AND CERTIFIED PATIENTS RECEIVED

For Terms and further information apply to the MEDICAL SUPERINTENDENT Telephone: GATLEY 2231

ST. ANDREW'S HOSPITAL
FOR NERVOUS AND MENTAL DISORDERS

NORTHAMPTON

PRESIDENT: THE MOST HON. THE MARQUESS OF EXETER, K.G., C.M.G., A.D.C.

MEDICAL SUPERINTENDENT: THOMAS TENNENT, M.D., F.R.C.P., D.P.H., D.P.M.

This Registered Hospital is situated in 130 acres of park and pleasure grounds. Voluntary patients, who are suffering from incipient mental disorders or who wish to prevent recurrent attacks of mental trouble; temporary patients, and certified patients of both sexes are received for treatment. Careful clinical, bio-chemical, bacteriological, and pathological examinations. Private rooms with special nurses, male or female, in the Hospital or in one of the numerous villas in the grounds of the various branches can be provided.

WANTAGE HOUSE

This is a Reception Hospital in detached grounds with a separate entrance, to which patients can be admitted. It is equipped with all the apparatus for the complete investigation and treatment of Mental and Nervous Disorders by the most modern methods; insulin treatment is available for suitable cases. It contains special departments for hydrotherapy by various methods, including Turkish and Russian baths, the prolonged immersion bath, Vichy Douche, Scotch Douche, Electrical baths, Plombieres treatment, etc. There is an Operating Theatre, a Dental Surgery, an X-Ray Room, an Ultra-violet Apparatus, and a Department for Diathermy and High-frequency treatment. It also contains Laboratories for bio-chemical, bacteriological, and pathological research. Psychotherapeutic treatment is employed when indicated.

MOULTON PARK

Two miles from the Main Hospital there are several branch establishments and villas situated in a park and farm of 650 acres. Milk, meat, fruit, and vegetables are supplied to the Hospital from the farm, gardens, and orchards of Moulton Park. Occupational therapy is a feature of this branch, and patients are given every facility for occupying themselves in farming, gardening, and fruit growing.

BRYN-Y-NEUADD HALL

The seaside house of St. Andrew's Hospital is beautifully situated in a Park of 330 acres, at Llanfairfechan, amidst the finest scenery in North Wales. On the North-West side of the Estate a mile of sea coast forms the boundary. Patients may visit this branch for a short seaside change or for longer periods. The Hospital has its own private bathing house on the seashore. There is trout-fishing in the park.

At all the branches of the Hospital there are cricket grounds, football and hockey grounds, lawn tennis courts (grass and hard courts), croquet grounds, golf courses, and bowling greens. Ladies and gentlemen have their own gardens, and facilities are provided for handicrafts, such as carpentry, etc.

For terms and further particulars apply to the Medical Superintendent (TELEPHONE: No. 2356 and 2357 Northampton), who can be seen in London by appointment.

CALDECOTE HALL

NUNEATON
WARWICKSHIRE
('Phone: Nuneaton 241)

Residential treatment of
"Nervous Disorders" & Alcoholism
(Certifiable cases are not received)

This beautiful mansion situated in the heart of the country (less than two hours from London by L.M.S.R.) and surrounded by charming pleasure grounds in which games and outdoor occupational therapy are available is devoted to the treatment of Alcoholism and "Nerves" by psychotherapeutic and ancillary methods.

Illustrated Brochure and particulars obtainable from A. E. CARVER, M.D., D.P.M., Resident Medical Superintendent.

CAMBERWELL HOUSE, 33, Peckham Road, London, S.E.5

Telegrams: "PSYCHOSIS, LONDON" — *Telephone:* RODNEY 4242 (2 lines)

FOR THE TREATMENT OF MENTAL DISORDERS

Completely detached Villas for mild cases. Voluntary Patients received. Twenty acres of grounds; own garden produce. Hard and grass tennis courts, putting greens, Recreation Hall with Badminton Court, and all indoor amusements. Occupational therapy, Calisthenics, Actino-therapy, prolonged immersion baths, shock and also modified insulin treatment. Chapel.

Senior Physician, Dr. HUBERT JAMES NORMAN, assisted by a resident Medical Staff and visiting Consultants

An Illustrated Prospectus giving fees, which are strictly moderate, may be obtained upon application to the Secretary

The Convalescent Branch is HOVE VILLA, BRIGHTON and is 200 ft. above sea-level

CHISWICK HOUSE,

PINNER, MIDDLESEX.
Telephone: PINNER 234.

A Private Hospital for the Treatment and Care of Mental and Nervous Illnesses in both Sexes.

A modern country house, 12 miles from Marble Arch, in attractive and secluded surroundings. Fees from 10 guineas per week inclusive. Cases under Certificate, Voluntary and Temporary Patients received for treatment.

DOUGLAS MACAULAY, M.D., D.P.M.

THE COTSWOLD SANATORIUM

On the Cotswold Hills, seven miles from Cheltenham, Stroud and Gloucester. Fully equipped for the treatment of all forms of Tuberculosis.

Terms: 5½ to 9½ guineas per week, inclusive.

Full particulars from MEDICAL SUPERINTENDENT, COTSWOLD SANATORIUM, CRANHAM, GLOUCESTER
Telephone: Witcombe 81 Telegrams: "Hoffman Birdlip"

CRICHTON ROYAL, DUMFRIES

FOR NERVOUS AND MENTAL DISORDERS

Cases of Alcoholism and Drug Addiction are admitted. Every facility for individual treatment on the most modern lines. As the Hospital is well endowed, terms are exceptionally moderate.

Medical Certificates given anywhere in the British Isles are valid for admission of patients.

Physician Superintendent: P. K. MCCOWAN, J.P., M.D., F.R.C.P., D.P.M., Barrister-at-Law. Tel.: Dumfries 1119.

CITY OF LONDON MENTAL HOSPITAL

Near DARTFORD, KENT

Ladies and Gentlemen received for treatment under certificates, and without certificates as either VOLUNTARY or TEMPORARY PATIENTS, at a weekly fee of £2 9s., and upwards

FENSTANTON

at "FIVE DIAMONDS," Chalfont St. Giles, Bucks

A Private Home for the Care and Treatment of a limited number of LADIES with Mental and Nervous Disorders. Certified, Voluntary, and Temporary Patients received. Mansion with 12 acres of ground (See *Medical Directory*, p. 2441.) Apply Resident Physician. Telephone: Little Chalfont 2046. Station: Chalfont and Latimer.

MALLING PLACE, KENT

For LADIES and GENTLEMEN of Unsound Mind.

Terms moderate. Apply to Resident Medical Superintendent. Telegrams: ADAM WEST MALLING. Telephone No. 2: MALLING.

Royal Waterloo Hospital for Children

AND WOMEN, Waterloo-road, London, S.E.1.

Applications are invited from Dental Surgeons (Male) to take charge of the DENTAL CLINIC held at the Hospital on Tuesday mornings (extractions) and Friday mornings (prosthetics). Full particulars given on application.

Applications, stating age, nationality, qualifications with dates, experience and details of previous appointments, accompanied by copies of testimonials, should be sent as soon as possible to: J. H. TEASDALE, Secretary.

UNIVERSITY EXAMINATION POSTAL INSTITUTION

17, RED LION SQUARE, LONDON, W.C.1

Over 50 years' experience

POSTAL COACHING FOR ALL MEDICAL EXAMINATIONS

MEDICAL PROSPECTUS (36 pages)
sent gratis, along with List of Tutors, &c., on application to the Principal, 17, Red Lion Square, London, W.C.1. (Telephone: HOLborn 8313.)

Examining Surgeons:

FACTORIES ACT, 1937.

The following appointments as Examining Surgeons under the Factories Act, 1937, are vacant.

Applications should be sent to the CHIEF INSPECTOR OF FACTORIES, St. James's-square, S.W.1.

District	*County*	*Latest date for receipt of application*
NORWICH ..	NORFOLK ..	23RD NOVEMBER, 1943
CONSETT ..	DURHAM ..	23RD NOVEMBER, 1943

The Prince of Wales's General Hospital,

London, N.15.

Applications are invited for the appointments of HONORARY CLINICAL ASSISTANTS for the year 1944 in the following departments of the Hospital:—

Medical; Neurological; Children; Allergy; Skin; Psychiatric; Surgical; Fracture; Gynæcological; Ear, Nose, and Throat; Eye; Genito-urinary; X-ray; Physical Medicine; Dental.

Applications for appointment to any of these posts should be sent on or before Monday, 15th November, to—

J. C. BURDETT, Director and House Governor.

26th October, 1943.

The Belgrave Hospital for Children,

1, Clapham-road, S.W.9.

The Committee of Management invite applications from registered medical practitioners, Male and Female, for the appointment of RESIDENT HOUSE OFFICER (A), vacant 1st December. Salary is at the rate of £100 per annum, with full residential emoluments. The successful candidate would become eligible for a further emolument in the first-aid post if willing and able to undertake duties. Practitioners within three months of qualification and liable under the National Service Acts may apply, when appointment will be for a period of six months.

Applications, with copies of testimonials, stating age, should be forwarded as soon as possible to: THOS. CLAPHAM, Secretary.

Memorial Hospital,

Shooter's Hill, London, S.E.18.
(General Hospital—137 Beds.)

Applications are invited from Male registered medical practitioners for appointment as JUNIOR RESIDENT MEDICAL OFFICER (A). The appointment will be for six months, with effect from 1st December, 1943. Salary £175 p.a., with full residential emoluments. Practitioners within three months of qualification and liable under the National Service Acts may apply.

Application should be made on the prescribed form, obtainable from the undersigned, and sent in to reach him not later than 15th November, 1943. R. S. G. HUTCHINGS, Secretary.

The Queen Elizabeth Hospital for

CHILDREN, Hackney-road, E.2.

APPOINTMENT OF HOUSE PHYSICIAN (A).

Applications are invited from registered medical practitioners, Male and Female, for the above appointment, vacant 1st January, 1944. Appointment will be for six months. Salary at rate of £150 p.a., with full residential emoluments. Practitioners within three months of qualification and liable under the National Service Acts may apply.

Application forms may be obtained from the undersigned and should be returned, with copies of not more than three testimonials, on or before 27th November, 1943.

CHARLES H. BESSELL, General Secretary.

The Queen Elizabeth Hospital for

CHILDREN, Glamis-road, Shadwell, E.1

APPOINTMENT OF HOUSE PHYSICIAN (B2).

Applications are invited from registered medical practitioners, Male and Female, for the above appointment, vacant 1st January, 1944. The appointment will be for six months. Salary is at rate of £200 per annum, with full residential emoluments. R and W practitioners now holding A posts may apply.

Application forms may be obtained from the undersigned and should be returned, with copies of not more than three testimonials, on or before 27th November, 1943.

CHARLES H. BESSELL, General Secretary.

Queen Elizabeth Hospital, Hackney-road, E.2.

The Queen Elizabeth Hospital for

CHILDREN, Hackney-road, E.2.

Applications are invited from registered medical practitioners for the appointment of ORTHOPTIST. Attendance required on one half-day each week to be arranged. An honorarium of one guinea an attendance will be paid.

Apply, with full particulars of qualifications and experience, to the SECRETARY as above.

The Salvation Army.

THE MOTHERS' HOSPITAL,
Lower Clapton-road, Clapton, E.5.

Applications are invited from medical Women for the post of JUNIOR RESIDENT MEDICAL OFFICER (B2), vacant 1st December. Salary £110 per annum, with board, residence, and laundry. The appointment is for six months. W practitioners who now hold A posts may also apply.

Applications, with testimonials, to be sent to the SECRETARY-SUPERINTENDENT.

The Princess Louise Kensington Hos-

PITAL FOR CHILDREN, St. Quintin-avenue,
North Kensington, W.10.

Applications are invited for the appointment of RESIDENT MEDICAL OFFICER (B2), wanted immediately. Salary is at the rate of £200 per annum, with full residential emoluments. Practitioners now holding A posts may apply, when appointment will be limited to six months.

Applications, stating age, nationality, qualifications, and accompanied by copies of recent testimonials, to the SECRETARY.

Battersea General Hospital,

London, S.W.11.

The Board of Management invite applications from duly qualified practitioners for the appointment of ANÆSTHETIST on the Honorary Medical Staff of the Hospital. The appointment, in the first instance, will be for the duration of the war. It is probable that the practitioner appointed will be enrolled in the Emergency Medical Service in connexion with the treatment of air-raid casualties and receive remuneration on a sessional basis.

Applications, stating age, nationality, qualifications, and experience, should be sent to the SECRETARY of the Hospital as soon as possible.

The Nelson Hospital, Merton, S.W.20.

Applications are invited from registered medical practitioners, Male, for the appointment of HOUSE SURGEON (A), vacant 15th December, 1943. Salary is at the rate of £200 per annum, with full residential emoluments. Practitioners within three months of qualification and liable under the National Service Acts may apply, when appointment will be for a period of six months; otherwise may be extended.

Applications to: Miss E. M. FORTER, Secretary.

The Elizabeth Garrett Anderson

HOSPITAL, Euston-road, N.W.1.

Applications are invited from registered medical Women practitioners for the appointment of OBSTETRIC ASSISTANT (B2), vacant 1st January, 1944. Appointment for six months. Salary £200 per annum, with full residential emoluments. W practitioners holding A posts may also apply.

Applications, with copies of three testimonials, to be sent to the SECRETARY by Monday, 29th November, 1943.

Chelsea Hospital for Women, S.W.3.

Applications are invited from registered medical practitioners, Male or Female, for the post of HOUSE SURGEON (B2), from 1st January, 1944. Salary is at the rate of £200 per annum, together with board, residence, and laundry. R and W practitioners holding A posts may also apply, when appointment will be limited to six months.

Applications, giving full particulars as to qualifications, &c., accompanied by copies of three recent testimonials, should be forwarded not later than Friday, 26th November, to—

GEO. W. COOLING, Secretary.

The Hospital for Sick Children,

Great Ormond Street, London, W.C.1.

Two vacancies for HOUSE PHYSICIANS (B2) will occur on January 1, 1944. Salary £200 per annum with full residential emoluments. One post is tenable at the Children's Unit at the Sector Hospital, Hemel Hempstead, and the other at the above address. Both appointments are for six months. R and W practitioners holding A posts may also apply.

Further particulars and form of application, which must be returned not later than 22nd November, 1943, are obtainable from the undersigned. H. F. RUTHERFORD, Secretary.

Weir Hospital, Weir Road, Balham,

S.W.12.

LOCUM, Part-time, Female, required immediately. Salary £100.

All particulars on application to HONORARY SECRETARY-SUPERINTENDENT.

HIS MAJESTY'S COLONIAL SERVICE

THE COLONIAL MEDICAL SERVICE

VACANCIES FOR MEDICAL OFFICERS

The maintenance of an efficient Colonial Medical Service constitutes a vital part of the national war effort and it is most important that the Service should be assured of an adequate supply of doctors.

The Secretary of State for the Colonies therefore invites applications from doctors possessing a medical qualification registrable in the United Kingdom who are British subjects and who are under thirty-five years of age.

Medical Officers are appointed in the first instance for general service. But there are ample opportunities for work in special branches of medicine and surgery, in public health and in medical research.

The normal salary scale is from £600 to between £1,000 and £1,120. There are large numbers of super-scale posts to which promotion is made on merit and which carry higher salaries.

Government quarters, in many cases free of rent, and first-class passages to and from the Colonies are provided, and an adequate pension scheme is in force.

Selected candidates are normally required to attend a course of instruction in Tropical Medicine and Hygiene either before proceeding overseas or during their first period of leave.

Further particulars, including the regulations governing admission to the Colonial Medical Service, may be obtained from the Director of Recruitment (Colonial Service), 2, Park-street, London, W.1.

St. Thomas's Hospital, S.E.1.

There is a vacancy for the post of MEDICAL OFFICER IN CHARGE of the RADIOTHERAPEUTIC DEPARTMENT of the Hospital. Salary £850 to £1200 a year, with private practice allowed in the Hospital under certain conditions. The appointment will be for the duration of hostilities, after which it will be advertised with other vacancies on the staff of the Hospital, when the holder of the appointment will be eligible to apply.

Applications should be sent to the SECRETARY not later than 6th November, 1943.

The London Chest Hospital,

Victoria Park, E.2.

The Board of Management desire to appoint for the war period two additional HONORARY ANÆSTHETISTS. Experience in thoracic work is desirable but not essential. An attendance honorarium is payable.

Applications, in triplicate, should be sent not later than 30th November to: THOMAS BROWN, Secretary.

Maida Vale Hospital for Nervous

DISEASES, London, W.9.

APPOINTMENT OF MEDICAL REGISTRAR (B1).

Applications are invited from registered practitioners for the above post, vacant 1st December. Honorarium £100 per annum. Suitably qualified R and W practitioners holding B2 posts, also R practitioners holding B1 and rejected by the R.A.M.C., may apply.

Applications, with copies of three recent testimonials, should be addressed to the SECRETARY by the 23rd November.

Guy's Hospital Medical School.

Applications are invited for the post of MEDICAL TUTOR AND ACTING MEDICAL REGISTRAR, to commence duties on 1st January, 1944. The post carries an honorarium for teaching of £50 per annum, and is held in conjunction with an E.M.S. The appointment is a B1 post at a salary of £350 per annum or £550 per annum dependant upon experience. In either case with board and lodging or £100 per anunm in lieu thereof. The successful candidate must be prepared to take up duties at Guy's Hospital or at one of the E.M.S. Hospitals in Sector 10. R and W practitioners holding B2 appointments, also R practitioners holding B1 and rejected by the R.A.M.C. may apply.

Applications should be lodged with the DEAN, Guy's Hospital Medical School, London Bridge, S.E.1, on or before 27th November, 1943.

Battersea General Hospital,

London, S.W.11.

The Board of Management invite applications from duly qualified practitioners (Male or Female) for the appointment of PHYSICIAN on the Honorary Medical Staff of the Hospital. The appointment is of a temporary nature and may be terminated, after due notice, either before or at the end of the war. The practitioner appointed will be expected to take charge of a weekly out-patient clinic and to attend at the Hospital in regard to in-patients on such other occasions as circumstances require.

Applications, stating age, nationality, qualifications, and experience, should be sent to the SECRETARY of the Hospital as soon as possible.

Tilbury Hospital, Essex.

Applications are invited for the post of HOUSE OFFICER (A), including duties of Casualty Officer, from registered British practitioners, including practitioners within three months of qualification and liable under the National Service Acts, when appointment will be for a period of six months. Salary at the rate of £160 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, and accompanied by copies of three recent testimonials, to be sent immediately to the undersigned, marked "Tilbury."

F. A. LYON, Secretary.

Seamen's Hospital Society, Greenwich, S.E.10.

Dreadnought Seamen's Hospital,

GREENWICH, S.E.10.

Locum Tenens RESIDENT HOUSE SURGEON (B1) required for the month of December. 8 guineas per week with full emoluments. Apply immediately, with copies of recent testimonials, to: F. A. LYON, Secretary.

Seamen's Hospital Society, Greenwich, S.E.10.

Borough of Ilford.

ISOLATION HOSPITAL.

ASSISTANT MEDICAL OFFICER OF HEALTH AND RESIDENT MEDICAL OFFICER.

Applications are invited from qualified medical practitioners for the above temporary appointment at a salary of £700 per annum, plus a temporary war cost-of-living bonus of £33 16s. per annum, such salary to be inclusive of emoluments, in respect of which deduction or salary adjustment will be made. Candidates should be over military age or otherwise exempt from service with the Forces for reasons which must be stated in the application. The person appointed will be required to work under the direction of the Medical Officer of Health and to act as Resident Medical Officer at the Council's Isolation Hospital and Sanatorium, and perform such other duties as may be allocated to him by the Medical Officer of Health. The appointment will be subject to the provisions of the Local Government Superannuation Act, 1937, and to the staff regulations of the Council for the time being in force. The selected applicant will be required to pass a medical examination by and to the satisfaction of the Medical Officer of Health. The appointment will also be subject to one month's notice on either side.

Applications, stating age, qualifications, and experience, present employment and salary, accompanied by copies of three recent testimonials, must be received by me at the Town Hall, Ilford, not later than the 24th November, 1943.

Canvassing, directly or indirectly, will be a disqualification.

CHARLES N. ROBERTS, Town Clerk.

Town Hall, Ilford, 4th November, 1943.

Kingsway Hospital (Borough Mental

HOSPITAL), DERBY.

TEMPORARY ASSISTANT MEDICAL OFFICER (B1) required. Male or Female. Previous experience in a mental hospital is desirable but not necessary. Suitably qualified R practitioners holding B2 appointments, also R practitioners holding B1 and rejected by R.A.M.C., may apply. Salary £350–£450 per annum, by four £25 increases, with full residential emoluments and £50 per annum for D.P.M.

Applications to be sent to the MEDICAL SUPERINTENDENT.

East Suffolk and Ipswich Hospital,

IPSWICH. (400 Beds—7 Residents.)

Applications are invited from registered medical practitioners, including those within three months of qualification and liable under the National Service Acts, for the appointment of HOUSE SURGEON (A) to the GYNÆCOLOGICAL AND OBSTETRICAL DEPARTMENT, vacant 9th December. Appointment will be for a period of six months. The salary is at the rate of £175 per annum, with full residential emoluments.

Apply: ARTHUR GRIFFITHS, Secretary.

The Hospital, Ipswich, 13th November, 1943.

St. Andrew's Hospital, Billericay.

Applications are invited from registered medical practitioners, Male and Female, including R and W practitioners who now hold A posts, for the appointment of a HOUSE OFFICER (B2) at the above Hospital. The salary is at the rate of £200 p.a., with full residential emoluments. To R or W practitioners the appointment will be limited to six months; otherwise will not exceed one year.

Applications should be made in writing to the COUNTY MEDICAL OFFICER, County Hall, Chelmsford, and should include applicant's full name, age, nationality, qualifications, and details of previous posts (if any), and whether liable under the National Service Acts.

Essex County Council.

MEDICAL STAFF.

Applications are invited from registered Male medical practitioners for the undermentioned appointments at the ESSEX COUNTY COUNCIL HOSPITAL, Broomfield, which contains 320 Beds for the treatment of male patients suffering from pulmonary or surgical tuberculosis.

SECOND ASSISTANT MEDICAL OFFICER (B1). Applicants should have held house appointments and have had experience in the treatment of tuberculosis. The appointment will be limited to a period not exceeding four years. Salary at the rate of £350 a year, rising, subject to satisfactory service, by annual increments of £25 to £425 a year, together with residential emoluments valued at £160 a year. Suitably qualified R practitioners holding B2 appointments, also those now holding B1 and rejected by the R.A.M.C., may apply.

JUNIOR RESIDENT MEDICAL OFFICER (B2). The salary is at the rate of £250 a year, together with residential emoluments valued at £160 a year. R practitioners holding A posts may also apply, when appointment will be limited to six months; otherwise will be for twelve months.

Forms of application may be obtained from the undersigned to whom they should be returned completed, accompanied by copies of three recent testimonials and in envelopes endorsed with the name of the post sought, not later than the 30th day of November, 1943.

Canvassing, whether directly or indirectly, is forbidden.

JOHN E. LIGHTBURN, Clerk of the County Council.

County Hall, Chelmsford, 4th November, 1943.

County Borough of Burton upon Trent.

Applications are invited from duly qualified practitioners for the appointment of TEMPORARY DEPUTY MEDICAL OFFICER OF HEALTH, ASSISTANT SCHOOL MEDICAL OFFICER, AND ASSISTANT TUBERCULOSIS OFFICER, at a commencing salary of £600 per annum (plus cost-of-living bonus which at present amounts to £55 per annum), rising, subject to satisfactory service, by annual increments of £25 to £750 per annum, together with a motor-car allowance of £50 per annum.

The appointment is subject to the passing by the successful applicant of a medical examination, and to determination by one month's written notice on either side.

The person appointed must have a Diploma in Public Health, special knowledge of the treatment of tuberculosis and infectious diseases, and must have had not less than three years' post-graduate experience. He will be required to devote the whole of his time to the duties of the office and to act under the direction of the Medical Officer of Health.

Applicants should submit with their applications full information as to their liability for military service, medical fitness, and position as regards deferment. Forms of application will not be issued but full particulars of duties and conditions of appointment will be supplied by me upon application.

Applications, stating age, experience, and qualifications, endorsed "Temporary Deputy Medical Officer of Health," must be delivered to me, with copies of not more than three recent testimonials, not later than the 26th November, 1943. Canvassing will disqualify. H. BAILEY CHAPMAN, Town Clerk.

Town Hall, Burton upon Trent, 1st November, 1943.

Preston and County of Lancaster Royal

INFIRMARY. (Maternity Hospital.)

Applications are invited from registered medical practitioners, Male and Female, for the appointment of RESIDENT OBSTETRICIAN (B2). The salary is at the rate of £200 per annum, but a higher salary will be offered to a practitioner holding the D.R.C.O.G. R and W practitioners who now hold A posts may apply, when appointment will be limited to six months.

Applications, stating age and qualifications with dates, accompanied by copies of three recent testimonials, to be sent to: JOHN GIBSON, Superintendent, Royal Infirmary, Preston.

East Suffolk and Ipswich Hospital,

IPSWICH. (400 Beds—7 Residents.)

Applications are invited from registered medical practitioners for the post of RESIDENT MEDICAL OFFICER (B1), Male, now vacant. Applicants should have held house appointments and preference will be given to candidates holding diploma of F.R.C.S. Salary for a single man at the rate of £400 per annum, with full residential emoluments, and for a married man at the rate of £500 per annum, with house, free of rates, and allowance for lighting and heating, but without board. Suitably qualified R practitioners holding B2 appointments, also those holding B1 and rejected by the R.A.M.C., may apply.

Applications to be sent to: ARTHUR GRIFFITHS, Secretary, The Hospital, Ipswich.

13th November, 1943.

Harlow Wood Orthopædic Hospital,

Near MANSFIELD, NOTTS.

(405 Beds, E.M.S. and Civilian, including Rehabilitation Unit.)

Regional Orthopædic Centre.

Applications are invited from registered medical practitioners, Male and Female, for the appointment of RESIDENT HOUSE SURGEON (B2), vacant 1st December, 1943. Appointment will be for a period of six months. Salary at the rate of £200 p.a., with full residential emoluments. R and W practitioners holding A posts may also apply.

D. ROBERTS, Secretary-Superintendent.

The King Edward VII Welsh National

MEMORIAL ASSOCIATION.

Applications are invited from registered medical practitioners (Male or Female, single) for the appointment of TEMPORARY ASSISTANT RESIDENT MEDICAL OFFICER (B1) at the ADELINA PATTI HOSPITAL, Craig-y-nos, Swansea Valley (114 Beds for the treatment of pulmonary tuberculosis in men and women, and surgical tuberculosis in children). Applicants should have held house appointments and had institutional experience in the treatment of pulmonary tuberculosis. Salary £350–£25–£450 per annum, plus full residential emoluments. Suitably qualified R and W practitioners holding B2 appointments, also R practitioners holding B1 appointments and rejected by the R.A.M.C., may apply.

Applications, stating age, nationality, qualifications, and experience, with particulars as to liability for military service and medical fitness, together with copies of three recent testimonials, should reach the undersigned as soon as possible.

NORMAN TATTERSALL, Principal Medical Officer.

Memorial Offices, Cathays Park, Cardiff.

City and County of the City of Exeter.

CITY HOSPITAL (PUBLIC ASSISTANCE).

Applications are invited from Male registered medical practitioners for the post of MEDICAL OFFICER (B1) (Temporary) of the above Institution. Applications from R practitioners cannot be considered unless they have been rejected by the R.A.M.C. and satisfactory evidence of this is submitted. The salary will be at the rate of £600 to £700 per annum, according to experience, together with free quarters, board, and laundry for a single man; or an additional £100 per annum for a married man, non-resident. The appointment will be for twelve months in the first instance and thereafter at two calendar months' written notice on either side. Any fees received must be returned to the City Council. Preference will be given to candidates with experience in a similar appointment. The successful candidate will be required to devote the whole of the time to the duties, and he will be on the staff of the Medical Officer of Health.

An application form, together with particulars of the duties, may be obtained from the undersigned, to whom it should be returned, together with copies of two recent testimonials, not later than 24th November.

C. J. NEWMAN, Town Clerk and Public Assistance Officer.

Exeter, 13th November, 1943.

Gloucestershire County Council.

Applications are invited for the appointment of TEMPORARY DEPUTY COUNTY MEDICAL OFFICER OF HEALTH (Male) at a salary of £750 per annum, rising by annual increments of £50 to a maximum of £900 per annum. Travelling and subsistence allowances will be paid in accordance with the County scale. Applicants must be registered medical practitioners, holding a Diploma in Public Health, and have experience in general public health duties and in the administrative work of a public health department. The selected candidate will be required to undergo a medical examination.

Forms of application, with particulars of the duties and conditions of appointment, may be obtained from the County Medical Officer of Health, Langham House, Berkeley-street, Gloucester, to whom completed applications, with copies of three recent testimonials, should be sent not later than the 29th November, 1943.

Canvassing, directly or indirectly, will be a disqualification.

GUY H. DAVIS, Clerk of the County Council.

Shire Hall, Gloucester.

Kent County Council.

COUNTY HOSPITAL, FARNBOROUGH. (1000 Beds.)

TEMPORARY RESIDENT MEDICAL OFFICER (B2).

Applications are invited from suitably qualified registered medical practitioners of either sex for the above appointment. Although the main purpose of the appointment is for receiving ward work, the successful candidate will be expected to undertake any other duties in the Hospital as may be required. The salary is £200 a year, with full residential emoluments. Superannuation can be arranged and the successful candidate will be required to pass a medical examination. R and W practitioners who now hold A posts may apply, when the appointment will be limited to six months; otherwise will not exceed one year.

Applications should state age, qualifications, experience, and the names and addresses of two responsible persons to whom reference may be made as to professional ability, and should be addressed to the County Medical Officer, County Hall, Maidstone, so as to reach him by 26th November, 1943.

W. L. PLATTS, Clerk of the County Council.

County Hall, Maidstone, November, 1943.

City of Manchester.

CRUMPSALL HOSPITAL. (1400 Beds.)

APPOINTMENT OF LOCUM TENENS ASSISTANT SURGICAL OFFICER (B1) (RESIDENT).

Applications are invited from registered medical practitioners for the above-mentioned appointment for a period of four to six weeks commencing approximately 1st December, 1943, at a fee of £10 10s. weekly, plus full residential emoluments. Experience of emergency surgery would be an advantage.

Apply to Dr. W. A. RAMSAY, Medical Superintendent, Crumpsall Hospital, Manchester, 8, at once.

Royal Devon and Exeter Hospital,
EXETER.

Applications are invited from registered medical practitioners, Male and Female, for the appointment of RESIDENT FIRST HOUSE SURGEON (B2), vacant 8th December next. The salary is at the rate of £160 per annum, with full residential emoluments. R and W practitioners holding A posts may also apply, when appointment will be limited to six months.

Applications, with copies of two recent testimonials, should reach me by 12 NOON on 23rd November.

L. PARKHOUSE, Secretary.

West Suffolk General Hospital,
BURY ST. EDMUNDS.
(191 Civilian Beds—244 E.M.S. Beds.)

Applications are invited from registered medical practitioners, Male or Female, for the appointment of HOUSE SURGEON (A). Salary is at the rate of £150 per annum, with full residential emoluments. Practitioners within three months of qualification and liable under the National Service Acts may apply, when appointment will be for a period of six months.

Applications, stating age, experience, qualifications, and nationality, should be sent, accompanied by copies of three recent testimonials, to: E. E. HARDWICKE, Secretary.

2nd November, 1943.

Beckett Hospital and Dispensary,
BARNSLEY.

Applications are invited from registered medical practitioners for the appointment of HOUSE SURGEON (A). Salary is at the rate of £175 per annum, with full residential emoluments. Practitioners within three months of qualification and liable under the National Service Acts may apply, when appointment will be for a period of six months.

Applications should be sent immediately to—

ARTHUR L. BOURNE, Secretary-Superintendent.

Royal Sheffield Infirmary and Hospital.

Applications are invited from registered medical practitioners, Male and Female, for the appointment of CLINICAL ASSISTANT (B1) to the FRACTURE AND ORTHOPÆDIC DEPARTMENTS at the Royal Hospital unit. Applicants should have held house appointments and have had orthopædic experience. Preference will be given to candidates holding diploma of F.R.C.S. Commencing salary is at the rate of £300 per annum, plus war bonus, non-resident. Suitably qualified R and W practitioners holding B2 appointments, also R practitioners holding B1 appointments and rejected by the R.A.M.C., may apply.

Applications to: W. H. BOOTH, Secretary, West-street, Sheffield.

Royal Albert Edward Infirmary and
DISPENSARY, WIGAN. (Normally 189 Beds.)

Applications are invited from registered medical practitioners (Male) for the appointment of HOUSE SURGEON (A), vacant 1st December. Salary is at the rate of £150 per annum, with full residential emoluments. Practitioners within three months of qualification and liable under the National Service Acts may apply, when appointment will be for a period of six months; otherwise it may be extended for a further period.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of three recent testimonials, should be sent as soon as possible to—

A. STANLEY BRUNT, General Superintendent and Secretary.

Royal Hospital, Richmond, Surrey.

Applications are invited from registered medical practitioners, Male and Female, for the appointment of HOUSE SURGEON (A), vacant 16th November. Salary is at the rate of £150 p.a., with full residential emoluments. Practitioners within three months of qualification and liable under the National Service Acts may apply, when appointment will be for a period of six months.

Apply to the HOUSE GOVERNOR AND SECRETARY.

King Edward VII Hospital, Windsor.

Applications are invited from registered medical practitioners for the appointment of RESIDENT SURGICAL OFFICER (B1), vacant 1st January, 1944. Applicants should have held house appointments and had surgical experience. Preference will be given to candidates holding diploma of F.R.C.S. Salary from £350 to £550 according to qualifications and experience, and according to E.M.S. scale.

Applications, with copies of recent testimonials, to be sent by 19th November, 1943, to: G. WESTON, Secretary.

The Warwickshire King Edward VII
MEMORIAL SANATORIUM, HERTFORD HILL,
Near WARWICK. (225 Beds, Pulmonary Tuberculosis.)

Applications are invited from registered medical Women, including W practitioners who now hold A posts, for the post of JUNIOR MEDICAL OFFICER (B2) at the above Sanatorium. No previous professional experience necessary. Salary at the rate of £350 p.a., with full residential emoluments. To W practitioners the appointment will be limited to six months; otherwise will not exceed one year.

Applications to be sent to the Medical Superintendent at the Sanatorium by 26th November, 1943.

Warwick. L. EDGAR STEPHENS, Clerk to Joint Committee.

City of Manchester.
PUBLIC HEALTH DEPARTMENT.

CRUMPSALL HOSPITAL. (1400 Beds.)

APPOINTMENT OF TEMPORARY VISITING CONSULTANT DENTIST (PART-TIME).

The Public Health Committee invites applications for the above-mentioned appointment at the Crumpsall Hospital, Manchester, 8. It does not carry with it the right of entry into the Corporation Superannuation Fund. The remuneration will be £350 per annum. Two normal sessions at the Hospital will be required each week with emergency sessions in addition, as required.

Forms of application and copies of a memorandum on the terms and conditions of the appointment may be obtained from the Medical Officer of Health, Hospitals Administration Section, G.P.O. Box 399, Town Hall, Manchester, 2, by whom applications must be received not later than 24th November, 1943. Canvassing in any form is prohibited.

R. H. ADCOCK, Town Clerk.

Town Hall, Manchester, 2, 29th October, 1943.

City of Manchester.

WITHINGTON HOSPITAL. (1150 Beds.)

APPOINTMENT OF RESIDENT ASSISTANT MEDICAL OFFICER (A).

Applications are invited from registered medical practitioners, Male or Female, for the above-mentioned appointment, vacant now. The basic salary for the appointment is £200 per annum, with board, residence, and laundry in addition, subject to the Manchester Corporation conditions of service. A temporary cost-of-living wages addition is payable in addition to the salary stated. Practitioners within three months of qualification and liable under the National Service Acts may also apply, when appointment will be for a period of six months; otherwise not exceeding one year.

Applications, stating the full name, age (giving date of birth), nationality, professional qualifications (with dates), particulars of present appointment and past hospital appointments, are to be addressed to the Medical Superintendent, Withington Hospital, West Didsbury, Manchester, 20, at once. Canvassing in any form is prohibited. R. H. ADCOCK, Town Clerk.

Town Hall, Manchester, 2, 4th November, 1943.

Royal Buckinghamshire Hospital,
AYLESBURY. (150 Beds.)

The following vacancies will arise on or about 1st January, 1944:—

Applications are invited from registered medical practitioners, Male and Female, for the following appointments:—

SENIOR HOUSE SURGEON (B2). The salary is at the rate of £180 per annum, with full residential emoluments. Opportunities afforded to work with London consultants. R and W practitioners now holding A posts may also apply, when appointment will be limited to six months.

JUNIOR HOUSE SURGEON (A) and HOUSE PHYSICIAN (A). Salary for both posts is at the rate of £120 per annum, with full residential emoluments. Opportunities afforded to work with London consultants, and to undertake duties, according to the post held, in all branches of medical and surgical practice including anæsthesia. Practitioners within three months of qualification and liable under the National Service Acts may apply, when appointments will be for a period of six months.

Applications, stating age, qualifications, and nationality, together with copies of two recent testimonials, to be sent not later than 24th November, 1943, to—

F. G. DAWES, Secretary-Superintendent.

Royal Buckinghamshire Hospital,
AYLESBURY.

Applications are invited for the post of HONORARY MEDICAL OFFICER-IN-CHARGE of the ELECTROTHERAPY AND MASSAGE DEPARTMENT. Duties will include holding of regular weekly out-patient clinic.

Further information, if desired, may be obtained from the SECRETARY-SUPERINTENDENT, Royal Buckinghamshire Hospital, Aylesbury, to whom applications, stating age, qualifications, &c., supported by two recent testimonials, should be sent not later than 27th November, 1943.

5th November, 1943.

Lancashire County Council.

WRIGHTINGTON HOSPITAL, Near WIGAN.

Applications invited for JUNIOR RESIDENT MEDICAL OFFICER (B2) at the Wrightington Hospital, containing 288 Beds for non-pulmonary tuberculosis (adults and children), 20 Beds for "combined" pulmonary and non-pulmonary cases, and 44 Beds for pulmonary cases. The medical staff consists of Medical Superintendent, three assistants, two Consultant Orthopædic Surgeons, and other visiting surgeons. Excellent facilities for reading for M.D. Salary £300 per annum, plus bonus, together with board, single quarters, and laundry. R and W practitioners holding A posts may also apply, when appointment will be limited to six months; otherwise one year.

Forms of application and conditions of appointment from CENTRAL TUBERCULOSIS OFFICER, County Offices, Preston. Mark letters "Wrightington M.O."

The General Infirmary at Leeds.

NATIONAL RADIUM CENTRE.

Applications are invited for the post of Full-time ASSISTANT RADIOTHERAPIST. Candidates should have had previous experience of radiotherapy, and should hold either the Diploma in Radiology or F.R.C.S. The post will be tenable for one year, with eligibility for reappointment. Salary £750 per annum.

Applications to be received by the undersigned not later than 30th November.

S. CLAYTON FRYERS, House Governor and Secretary.

Rotherham Hospital.

(General Voluntary Hospital—140 Beds.)

Applications are invited from registered medical practitioners for the appointment of HOUSE PHYSICIAN (A), vacant 22nd November. Salary £200 per annum, with full residential emoluments. Practitioners within three months of qualification and liable under the National Service Acts may apply, when the appointment will be for six months.

Applications, stating age, qualifications with dates, and nationality, accompanied by copies of recent testimonials, should be sent at once to the SECRETARY-SUPERINTENDENT.

Birmingham and Midland Eye Hospital,

Church-street, BIRMINGHAM, 3.

Applications are invited from registered medical practitioners, Male and Female, for the appointment of HOUSE SURGEON (B2), now vacant. Salary is at the rate of £130 per annum, with full residential emoluments, rising to £150 at the expiration of six months' satisfactory service. R and W practitioners now holding A posts may apply, when appointment will be limited to six months.

Applications, with full particulars, to be addressed to the HOUSE GOVERNOR.

The Lawn, Lincoln.

(Registered Hospital for Mental and Nervous Diseases.)

Applications are invited from registered medical practitioners (Male and Female) for ASSISTANT MEDICAL OFFICER (B2), one with previous mental hospital experience preferred. Electric convulsive therapy is in use. Salary £300 per annum, with emoluments and war bonus. R and W practitioners who now hold A posts may apply, when appointment will be limited to six months.

Apply the CHAIRMAN OF GOVERNORS, The Lawn, Lincoln.

Royal Infirmary, Preston.

Applications are invited from registered medical practitioners, Male or Female, for the appointment of HOUSE SURGEON (A) to the EYE AND EAR, NOSE, AND THROAT DEPARTMENT (recognised for D.O.M.S. and D.L.O. examinations). Salary £150 per annum, with full residential emoluments. Practitioners within three months of qualification and liable under the National Service Acts may also apply, when appointment will be for a period of six months.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of three recent testimonials, should be sent forthwith to—

Royal Infirmary, Preston. JOHN GIBSON, Superintendent.

Manchester Hospital for Consumption

AND DISEASES OF THE THROAT AND CHEST.

Applications are invited from registered medical practitioners, Male and Female, for the appointment of RESIDENT HOUSE SURGEON (B2) at the ST. ANNE'S HOSPITAL, Bowdon, Cheshire, now vacant. The Hospital has 50 Beds and the work is mainly ear, nose, and throat. Salary £250 per annum, with full residential emoluments. R and W practitioners who now hold A posts may apply, when appointment will be limited to six months.

Applications, stating age, qualifications, and nationality, and accompanied by copies of three recent testimonials, should be sent not later than 26th November, 1943, to—

45, Hardman-street, Manchester, 3. W. HUNT, Secretary.

Bath and Wessex Children's Orthopædic

HOSPITAL, COMBE PARK, BATH.

Applications are invited immediately from registered medical practitioners (Male or Female) for the appointment of HOUSE SURGEON (A); the duties include Fracture Service cases at adjoining Royal United Hospital. Salary at the rate of £150 per annum, with board, residence, and laundry. Practitioners within three months of qualification and liable under the National Service Acts may also apply, when appointment will be for a period of six months.

28th October, 1943. HAROLD J. FRICKER, Secretary.

St. Albans and Mid Herts Hospital,

Church-crescent, ST. ALBANS, HERTS. (58 Beds.)

Applications are invited from registered medical practitioners, Male or Female, for the appointment of ASSISTANT RESIDENT MEDICAL OFFICER (A). Salary at the rate of £150 p.a., with full residential emoluments. Practitioners within three months of qualification and liable under the National Service Acts may also apply, when the appointment will be for six months.

Applications, giving full particulars, to—

Mr. P. R. BATTISON, Secretary.

Victoria Hospital, Accrington.

Applications are invited from medical practitioners (Male) for the appointment of HOUSE SURGEON (B2). The salary is at the rate of £200 per annum, with full residential emoluments. R practitioners holding A posts may also apply, when appointment will be limited to six months.

Apply, with copies of two testimonials, to—

HONORARY SECRETARY.

Royal Salop Infirmary, Shrewsbury.

Applications are invited from registered medical practitioners, Male and Female, for the appointment of HOUSE PHYSICIAN (A), vacant immediately. Salary is at the rate of £160 per annum, with full residential emoluments. Practitioners within three months of qualification and liable under the National Service Acts may also apply. The appointment will be for a period of six months. J. W. NOBLE, Secretary-Superintendent.

Board Room, 30th October, 1943.

North Staffordshire Royal Infirmary,

STOKE-ON-TRENT.

The Committee invites applications for the temporary war-time appointment of ASSISTANT SURGEON to the EAR, NOSE, AND THROAT DEPARTMENT. Applicants should have had considerable recent experience in Oto-rhino-laryngology and should hold the Fellowship of one of the Royal Colleges or a Mastership in Surgery. Salary will be at the rate of £700 per annum, non-resident, and the successful applicant will be required to devote his whole time to the work of the Department.

Applications, giving full particulars, should be forwarded immediately to the HOUSE GOVERNOR, from whom further particulars may be obtained.

North Staffordshire Royal Infirmary,

STOKE-ON-TRENT. (472 Beds.)

Applications are invited from registered medical practitioners, Male and Female, for the appointment of HOUSE SURGEON (B2) to EAR, NOSE, AND THROAT and EYE DEPARTMENTS. Salary is at the rate of £185 per annum, with full residential emoluments. R and W practitioners holding A posts may apply, when appointment will be limited to six months.

Applications to be sent as soon as possible to the HOUSE GOVERNOR.

Royal Victoria Infirmary, Newcastle

UPON TYNE.

The House Committee by resolution declare vacant the office of HONORARY SURGEON. According to statutory provision every candidate must be a registered graduate in surgery of any university recognised by the General Council of Medical Education and Registration of the United Kingdom, or a registered Fellow, Member, or Licentiate of one of the Royal Colleges of Surgeons of the United Kingdom, provided that he is practising as a surgeon and not as a general practitioner.

Applications are invited for this vacancy and must be received by the House Governor, Royal Victoria Infirmary, Newcastle upon Tyne, not later than 27th November, 1943.

Canvassing in any form is prohibited.

5th November, 1943. A. W. SANDERSON, House Governor.

County Council Hospital, Hereford.

ASSISTANT MEDICAL OFFICER (B1) required for the above new general hospital of 476 Beds, including E.M.S. Hutted Wards. Someone keen on surgery preferred. Salary for the first year £350 per annum, plus a temporary cost-of-living bonus (at present £22 15s. per annum) and plus usual residential emoluments. If extended beyond one year the salary will rise by annual increments of £25 to £450 per annum, plus bonus and emoluments. Suitably qualified R and W practitioners holding B2 appointments, also R practitioners holding B1 appointments and rejected by the R.A.M.C., may apply.

Applications to: Mr. OGILVY REID, F.R.C.S., Medical Superintendent.

Grimsby and District General Hospital.

(237 Beds.)

Applications are invited from registered medical practitioners, Male and Female, for the appointment of RESIDENT CASUALTY OFFICER AND HOUSE SURGEON (A), vacant 1st December, 1943. Appointment is for six months. Salary at the rate of £175 per annum, with full residential emoluments. Practitioners within three months of qualification and liable under the National Service Acts may apply.

Applications, stating age, qualifications, nationality, and copies of three recent testimonials, to the SUPERINTENDENT.

County Council of the West Riding of

YORKSHIRE.

TEMPORARY ASSISTANT BACTERIOLOGIST.

Applications are invited from registered medical practitioners for the above-mentioned post in the BACTERIOLOGICAL and PATHOLOGICAL LABORATORIES of the County Public Health Department at a salary of £650 per annum.

Forms of application, setting out the conditions and terms of service, may be obtained from the undersigned, to whom completed forms must be delivered not later than the 22nd November, 1943. BERNARD KENYON, Clerk of the County Council.

County Hall, Wakefield, November, 1943.

Cornwall County Council.

Applications are invited from registered medical practitioners for the whole-time appointment of TEMPORARY CLINICAL TUBERCULOSIS OFFICER to reside in or near the City of Truro. The person appointed will be required to work under the direction of the County Medical Officer. He must devote his whole time to the duties of the office and undertake such other work as he may be required to do from time to time.

Applicants should have had special experience in tuberculosis, including dispensary and sanatorium work.

The commencing salary will be £750 per annum, rising by three biennial increments of £50 and one of £37 10s. to £937 10s., together with a travelling allowance in accordance with the County scale.

The appointment is subject to the Local Government Superannuation Act, 1937, and the successful candidate will be required to pass a medical examination.

Applications, stating age, qualifications, and experience, and enclosing copies of three recent testimonials, should reach the County Medical Officer, County Hall, Truro, not later than the 30th November, 1943.

The appointment is approved by the Ministry of Health.

L. P. NEW, Clerk of the County Council.

County Hall, Truro, 28th October, 1943.

City of Plymouth.

Applications are invited from duly qualified and registered medical practitioners, Male and Female, including practitioners within three months of qualification and liable under the National Service Acts, for the appointment of JUNIOR ASSISTANT MEDICAL OFFICER (A) at the CITY GENERAL HOSPITAL. The appointment will be for a period of six months, and terminable by one month's notice on either side. Salary is at the rate of £250 per annum, plus war bonus, with full residential emoluments. All fees received by the officer must be refunded to the Council. The duties will be mainly in the surgical side of the Hospital.

Further details may be obtained from the Medical Superintendent. Forms of application are not provided. Applications must be addressed to the undersigned, together with copies of not more than three recent testimonials, as soon as possible.

T. PEIRSON, Medical Officer of Health.

Seven Trees, Lipson-road, Plymouth.

City of Nottingham.

MASS RADIOGRAPHY.

Applications are invited for the post of PHYSICIAN experienced in chest diseases and the use of X-rays in connexion therewith, for whole-time service as Director of a mass radiography unit. The successful candidate will be required to organise the work of the unit, and arrangements will be made for him and his staff to undertake a special course of training in London. The appointment is being made with the consent of the Ministry of Health. Salary £750 per annum, rising by biennial increments of £50 and a final increment of £37 10s. to £937 10s., plus war bonus at the current rate.

Applications should be made upon a form which may be obtained from the undersigned, and returned as soon as possible.

J. E. RICHARDS, Town Clerk.

The Guildhall, Nottingham, October, 1943.

The Gloucestershire Royal Infirmary

AND EYE INSTITUTION, GLOUCESTER.
(Voluntary Hospital), (239 Beds and 143 E.M.S. Beds).

Applications are invited from medical practitioners (Male or Female) for the appointment of HOUSE SURGEON (A), duties to commence as soon as possible. (5 Residents.) Salary is at the rate of £150 per annum, with residential emoluments. Practitioners within three months of qualification and liable under the National Service Acts may also apply. The appointment will be for six months.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of three recent testimonials, should be addressed immediately to the HOUSE GOVERNOR, Royal Infirmary, Gloucester.

The King Edward VII Welsh National

MEMORIAL ASSOCIATION.

Applications are invited from registered medical practitioners (Female) for the appointment of JUNIOR RESIDENT MEDICAL OFFICER (B2) at the CEFN MABLY HOSPITAL, near St. Mellons, Mon (112 Beds for pulmonary tuberculosis in male and female patients). Salary at the rate of £200 per annum, with full residential emoluments. W practitioners who now hold A posts may apply, when appointment will be limited to six months; otherwise for one year.

Applications to be sent as soon as possible to—

NORMAN TATTERSALL, Principal Medical Officer.

Memorial Offices, Cathays Park, Cardiff.

King Edward VII Hospital, Windsor.

Applications are invited from registered medical practitioners, Male and Female, for the appointment of HOUSE SURGEON (B2), surgical post, vacant beginning of December. The salary is at the rate of £150 per annum, with full residential emoluments. R and W practitioners holding A posts may also apply, when appointment will be limited to six months.

Applications, with copies of recent testimonials, to be sent by 15th November, 1943, to: G. WESTON, Secretary.

City of Birmingham Education

COMMITTEE.

A TEMPORARY ASSISTANT SCHOOL MEDICAL OFFICER (Man or Woman) is required. Candidates must have had at least three years' experience in the practice of their profession subsequent to obtaining a registrable qualification. Salary according to "Askwith" scale (£500 to £700 by annual increments of £25) plus temporary war bonus. The commencing salary within this scale will depend upon previous experience and service. £10 per annum travelling expenses allowed. The consent of the Ministry of Health has been obtained to the making of this appointment. Candidates will be required to give full information as to their liability for military service, medical fitness, and position as regards deferment.

Forms of application (to be returned not later than first post on the 1st December, 1943), together with further information, obtainable from the undersigned on receipt of stamped addressed foolscap envelope. Communications to be endorsed "Temporary Assistant School Medical Officer." Canvassing will disqualify. P. D. INNES, Chief Education Officer.

Education Office, Margaret-street, Birmingham, 3.

The Stamford, Rutland and General

INFIRMARY.

Applications are invited from registered medical practitioners, Male and Female, for the appointment of HOUSE SURGEON (A), vacant 1st December, 1943. Salary is at the rate of £200 per annum, with full residential emoluments. Practitioners within three months of qualification and liable under the National Service Acts may also apply, when appointment will be for a period of six months.

Applications, stating age, qualifications with dates, nationality, and accompanied with copies of three testimonials, should be sent at once to: H. F. DONALD, Secretary-Superintendent.

Nottingham General Hospital.

(585 Beds.)

Applications are invited from registered medical practitioners, Male and Female, for the appointment of HOUSE PHYSICIAN (A). Duties to commence as soon as possible. Salary at the rate of £200 per annum, with full residential emoluments. Practitioners within three months of qualification and liable under the National Service Acts may also apply, when appointment will be for a period of six months.

Applications to be addressed to the undersigned, stating age, qualifications, experience, &c., together with copies of testimonials. HENRY M. STANLEY, House Governor and Secretary.

Royal South Hants and Southampton

HOSPITAL, SOUTHAMPTON. (255 Beds.)

Applications are invited from registered medical practitioners, Male and Female, including R and W practitioners who now hold A posts, for the appointment of HOUSE PHYSICIAN (B2), vacant immediately. The appointment will be for a period of six months. The salary is at the rate of £175 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, nationality, and present post, and accompanied by copies of three recent testimonials, should be sent immediately to—

EDWARD L. WIBROMAN, House Governor and Secretary.

The Welsh National School of Medicine.

(UNIVERSITY OF WALES.)

Applications are invited for the Full-time post of ASSISTANT LECTURER in the DEPARTMENT OF PATHOLOGY AND BACTERIOLOGY of the Welsh National School of Medicine, Cardiff, at a salary at the rate of £500 per annum, plus war bonus. The person appointed will be required to commence duty as soon as possible.

Further particulars of the appointment may be obtained from: S. C. EDWARDS, Secretary.

The Parade, Cardiff.

Royal Victoria Hospital, Dover.

Applications are invited from registered medical practitioners, Male or Female, for the appointment (vacant 1st December) of HOUSE SURGEON (A), for duty at Waldershare, near Dover, and O.P. and Casualty Department in Dover. Salary at £200 per annum, with full residential emoluments. Practitioners within three months of qualification and liable under the National Service Acts may also apply, when appointment will be for a period of six months.

Applications, stating age, qualifications, and nationality, together with copies of three recent testimonials, to be sent to the SECRETARY.

City of Lincoln Education Committee.

DENTAL SURGEON.

Applications are invited from fully qualified registered dental surgeons for the appointment of Dental Officer, whose chief duties will be in connexion with school-children. Salary £500–£25–£600 per annum. Commencing salary according to experience.

Further particulars and forms of application may be obtained from the Medical Officer of Health, Beaumont Fee, Lincoln.

C. W. HOOTON, Director of Education.

City Education Office, 4, Lindum-road, Lincoln.

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Manchester Royal Infirmary.

Applications are invited from registered medical practitioners for the appointment of a Full-time MEDICAL CHIEF ASSISTANT (B1), non-resident, shortly to become vacant. Applicants must have held house appointments and had medical experience. Preference will be given to candidates holding higher qualifications. Salary is at the rate of £450 per annum. Suitably qualified R practitioners holding B2 posts, also those holding B1 posts and rejected by the R.A.M.C., may apply.

Applications, stating age, nationality, qualifications with dates, experience and details of previous appointments, and accompanied by copies of three recent testimonials, should be forwarded to the undersigned.

By order, F. J. CABLE, General Superintendent.

County Borough of Warrington.

BOROUGH GENERAL HOSPITAL. (300 Beds.)

Applications are invited from registered medical practitioners for the post of RESIDENT MEDICAL OFFICER (B2). Salary £225 per annum, together with board, residence, and laundry. There are two other Medical Officers in residence; good opportunity for experience in midwifery and surgery. R and W practitioners who now hold A posts may apply, when appointment will be limited to six months; otherwise not to exceed one year.

Applications, stating age, qualifications, and experience, and date available to commence duties, together with copies of not less than three testimonials, to be sent not later than Tuesday, 16th November, 1943, to—

STUART F. ALLISON,
Health Department, Warrington. Medical Officer of Health.

County Borough of Preston.

SHAROE GREEN HOSPITAL. (250 Beds.)

Applications are invited from registered medical practitioners, Female, for the appointment of JUNIOR RESIDENT MEDICAL OFFICER (A), now vacant. Salary is at the rate of £200 per annum, with full residential emoluments. W practitioners within three months of qualification and liable under the National Service Acts may apply, when appointment will be for a period of six months; otherwise will not exceed one year.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of three recent testimonials, to the MEDICAL SUPERINTENDENT, Sharoe Green Hospital, Fulwood, Preston.

Southern Rhodesia Medical Service.

Applications are invited from fully qualified Male medical practitioners for appointment as GOVERNMENT MEDICAL OFFICER in the Southern Rhodesia Medical Service. Only single applicants should apply as married men will not be considered. Salary will be on the scale £600–£25–£750 per annum. There is also a senior grade (£750–£25–£900) to which promotions are made as vacancies occur. Salary will commence from the date of assumption of duty in Southern Rhodesia. In addition, private practice is allowed.

Candidates should have at least two years' postgraduate experience in medicine and preferably surgery. The successful applicant will be required to sign an agreement for three years' service in the first instance, and thereafter may make application to be placed on the pensionable establishment.

A free steamship passage to Cape Town and first-class railway ticket thence to Southern Rhodesia will be provided.

Canvassing, either directly or indirectly, will disqualify applicants.

Applications, stating age, qualifications, and experience, together with copies of testimonials, should reach the OFFICIAL SECRETARY, Office of the High Commissioner for Southern Rhodesia, Rhodesia House, 429, Strand, London, W.C.2 (from whom further particulars and application form may be obtained), not later than 27th November, 1943.

His Majesty's Colonial Service.

COLONIAL MEDICAL SERVICE.

The Government of SIERRA LEONE require the services of a WOMAN MEDICAL OFFICER early in 1944. Candidates must be British subjects and possess a medical qualification registrable in the United Kingdom. They must have had considerable experience in the medical care and inspection of schoolchildren. Salary is at the rate of £750 per annum. The appointment is on agreement for one tour of service of approximately eighteen months' duration. Free passages and free quarters are provided.

Further particulars and forms of application may be obtained from the DIRECTOR OF RECRUITMENT (Colonial Service), 2, Park-street, London, W.1.

Assistant wanted in good-class Practice

in Surrey. Car provided; live out; excellent salary.—Address, No. 358, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

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Practice in Midland county town. Excellent prospects. House to rent. Salary £1000 a year to include car expenses. Applicants must have had house appointments and some experience of family practice.—Address, No. 359, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

Assistant wanted in the Biochemical

DEPARTMENT of DUDLEY ROAD HOSPITAL for war duration. Candidate with experience of Hospital Biochemistry preferred. Salary according to qualifications and experience.

Applications to be sent to the MEDICAL SUPERINTENDENT, Dudley Road Hospital, Birmingham, 18.

Consultant wanted to act in an

advisory capacity to Manufacturers of Medicinal Preparations. Correspondence will be treated in strict confidence.—Address, No. 355, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

Doctors, Male and Female, required

for Locums and Assistantships. Good salaries paid. Vacancies for Ships' Surgeons.—Write, A. SHAW, Medical Agent, Premier Buildings, 88, Church-street, Liverpool, 1.

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required immediately at BODMIN EMERGENCY AND MENTAL HOSPITALS. Salary £300 per year. Applications, with testimonials, to the MEDICAL SUPERINTENDENT, Cornwall Mental Hospital, Bodmin.

Experienced Book-keeper Dispenser

requires post with doctor or firm of doctors in London, W.1 if possible.—Address, No. 360, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

Medical Typist undertakes Theses,

Tables, applications for Hospital Posts, 2s. 6d. per 1000 words.—JEPSON, 32, Alexandra-road, Hampstead, N.W.8.

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sold—Partnerships arranged—Valuations, Reports, &c.—Over 25 years' experience.—SONGHURST & RICKARD, Valuers and Surveyors, Guildhall Chambers, Exeter.

Physician, returning to Consulting

Practice (invalided from Service), wants good CONSULTING-ROOMS in Harley-street.—Please reply to Dr. BRUCE YOUNG, c/o Midland Bank Ltd., 159, Great Portland-street, W.1.

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